MARINE CORPS BASE HAWAII

INSTALLATION MASTER PLAN





Component Plans

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INSTALLATION MASTER PLAN





Component Plans

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Marine Corps Base Hawaii

Introduction

The Marine Corps Base Hawaii (MCB Hawaii) Installation Master Plan (IMP) is a 20-year comprehensive planning document for all Marine Corps land holdings in the State of Hawaii. The primary mission of MCB Hawaii is to maintain facilities and provide services in order to support military readiness and the global projection of operating forces of the III Marine Expeditionary Force (III MEF). To support this mission, MCB Hawaii has landholdings at seven separate locations on the island of Oʻahu and one on the Island of Molokaʻi. Since 1994, the Marine Corps installation at Kaneohe Bay has been the headquarters for MCB Hawaii. Other locations are designated as "Special Areas" under MCB Hawaii Kaneohe Bay, and include the following.

- Camp H.M. Smith (Camp Smith)
- Puuloa Range Training Facility (Puuloa RTF)
- Marine Corps Training Area Bellows (MCTAB)
- Pearl City Annex (PCA)
- · Manana Housing Area
- Waikane Valley Impact Area (WVIA)
- · Molokai Training Support Facility (Molokai TSF)

The MCB Hawaii Installation Master Plan consists of three separate documents: a volume containing the installation master plan; this volume, which contains the component plans, including seven area development plans and six facility site plans; and a comprehensive plan, which is a high-level, publicly releasable summary of the master plan. All of these plans are based on the suggested outlines put forth in Marine Corps Order 11000.12 (September 2014) and were developed in accordance with the master planning guidance outlined in the Unified Facilities Criteria (UFC) 2-100-01, Installation Master Planning (May 2012).

The component plans in this volume include the following.

Area Development Plans (ADP)

- MCB Hawaii Kaneohe Bay Aviation District
- MCB Hawaii Kaneohe Bay Base Support District
- MCB Hawaii Kaneohe Bay Ground Support District
- MCB Hawaii Kaneohe Bay Community Support District
- MCB Hawaii Kaneohe Bay Ulupau District
- · Camp H.M. Smith
- · Puuloa RTF

Facility Site Plans (FSP)

- Marine Corps Training Area Bellows
- · Pearl City Annex
- · Manana Housing Area
- · Waikane Valley Impact Area
- Molokai Training Support Facility

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Marine Corps Base Hawaii Installation Master Plan
Component Plans

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U.S. Marine Corps photo by Lance Cpl. Matthew Bragg. www.dvidshub.net

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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	ESPC	Energy Savings Performance Contract
AC	Acre	ESQD	Explosive Safety Quantity Distance
ADP	Area Development Plan	FT	Feet
AICUZ	Air Installation Compatible Use Zone	FY	Fiscal Year
ATC	Air Traffic Control	GA	Gallons
AT/FP	Antiterrorism/Force Protection	GIS	Geographic Information System
BEQ	Bachelor Enlisted Quarters	GM	Gallons per Minute
BFR	Basic Facility Requirement	HECO	Hawaiian Electric Company
BN	Battalion	НМН	Marine Heavy Helicopter Squadron
BL	Barrels	HMLA	Marine Light Attack Helicopter
BWS	Board of Water Supply		Squadron
CALA	Combat Aircraft Loading Area	HSM	Helicopter Maritime Strike Squadron
CCD	Construction Completion Date	HQ	Headquarters
CCN	Category Code Number	ICRMP	Integrated Cultural Resources Management Plan
CDET	College of Distance Education and Training	IMP	Installation Master Plan
CIP	Capital Improvement Plan	IN	Inch
CISD	Communications Information Systems Directorate	INRMP	Integrated Natural Resources Management Plan
CLB	Combat Logistics Battalion	IRP	Installation Restoration Program
COA	Course of Action	kV	Kilovolt
CPRW	Commander, Patrol and	LF	Linear Feet
CITW	Reconnaissance Wing	LHA	Landing Helicopter Assault Ship
dB	Decibel	LHD	Landing Helicopter Dock Ship
DNL	Day Night Average Sound Level	LOGCOM	Marine Corps Logistics Command
DoD	Department of Defense	LOX	Liquid Oxygen
DOH	Department of Health	LZ	Landing Zone
EA	Each	MAG	Marine Aircraft Group
EA	Environmental Assessment	MAGTF	Marine Air Ground Task Force
EAD	Estimated Award Date	MALS	Marine Aircraft Logistics Group
EIS	Environmental Impact Statement	MARFORPAC	U.S. Marine Corps Forces Pacific
EOD	Explosive Ordnance Detachment	MCAS	Marine Corps Air Station
LOD	=//piosite of all all the of all all the life		

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MCB Hawaii Marine Corps Base Hawaii SOI School of Infantry

MCCS Marine Corps Community Services SY Square Yard

MCO Marine Corps Order TECOM Marine Corps Training and Education

MCTAB Marine Corps Training Area Bellows Command

MG Million Gallon TSF Training Support Facility

MILCON Military Construction UDP Unit Deployment Program

MSL Mean Sea Level UFC Unified Facilities Criteria

MVA Megavolt Ampere UM Unit of Measure

MWR Morale, Welfare, and Recreation USPACOM U.S. Pacific Command

MWSD Marine Wing Support Detachment VMM Marine Medium Tiltrotor Squadron

NAS Naval Air Station VMU Marine Unmanned Aerial Vehicle

NAVFAC PAC Naval Facilities Engineering Command

NAVFAC PAC Naval Facilities Engineering Command

Pacific

VPU

Special Projects Patrol Squadron

NHL National Historic Landmark VR Navy Reserve Squadron

NOX Nitrogen Oxide WMA Wildlife Management Area

NRHP National Register of Historic Places WRF Water Reclamation Facility

OL Outlets, Number of WWBN Wounded Warrior Battalion

WWII World War II

PMO Provost Marshal's Office

PN Personnel

POL Petroleum, Oil, and Lubricants

Pearl City Annex

POV Privately-Owned Vehicle

PPV Public-Private Venture

PSI Pounds per Square Inch

PV Photovoltaic

PCA

RTF Range Training Facility

ROM Rough Order of Magnitude

SAIA Sikes Act Improvements Amendments

SCIF Sensitive Compartmented Information

Facility

SF Square Feet

SOCPAC Special Operations Command Pacific

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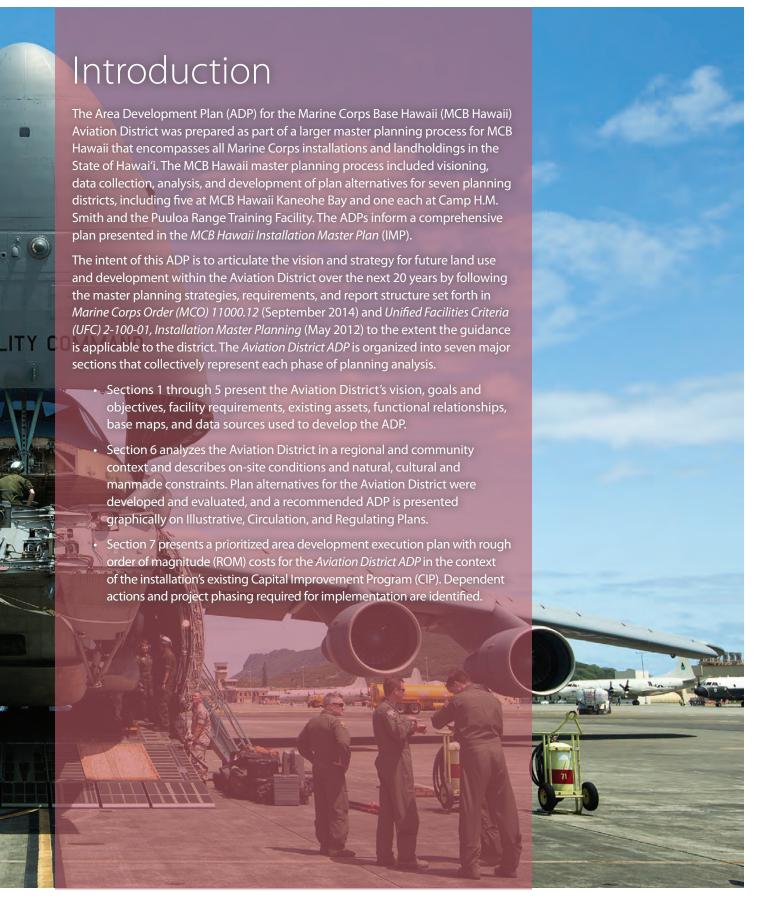


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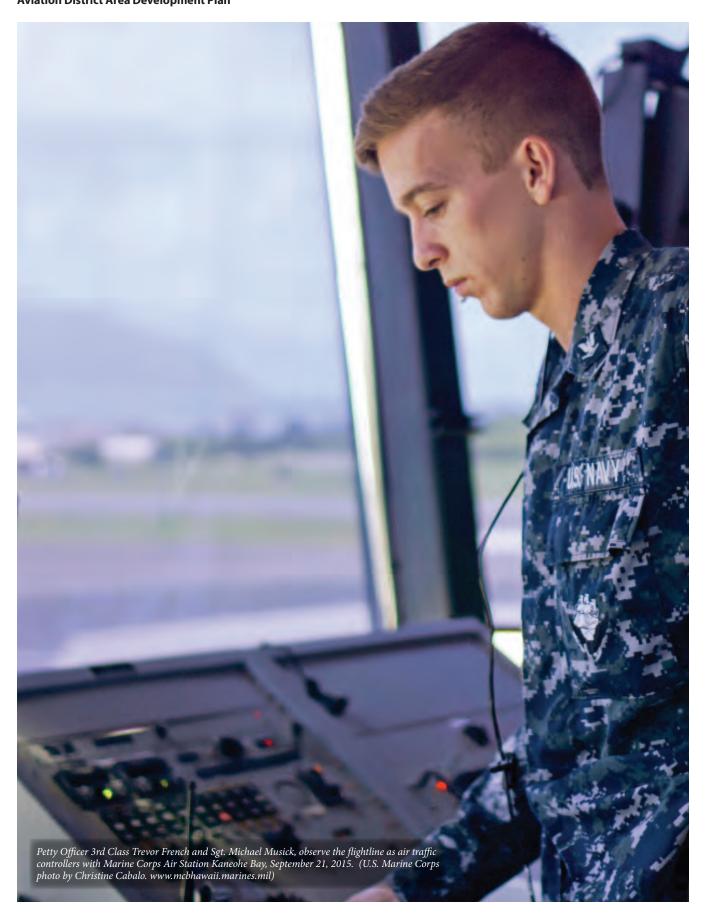
Aviation District Area Development Plan



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1 Vision, Goals, and Objectives

1.1 Background

The Aviation District is located on the western portion of Mōkapu Peninsula at MCB Hawaii Kaneohe Bay as shown on Figure 1-1. The majority of facilities in the Aviation District directly support Marine Corps and Navy fixed-wing and helicopter operations. Direct support functions include air traffic control; aircraft crash, fire, and rescue; aircraft refueling; and transient logistics. Administrative and maintenance spaces are provided for base and tenant aviation units. The area west of the runway, known as West Field, includes facilities that support aviation training, ordnance handling, MCB Hawaii waterfront operations, Explosive Ordnance Disposal (EOD), Marine Corps Community Services (MCCS), the 4th Force Reconnaissance Company Detachment, and other small tenants.

The Aviation District shares the installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.2 Aviation District

The Aviation District has its own vision, goals, and objectives that take into consideration the District's unique mission, functions, location and physical characteristics of the area.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable. The planning goals and objectives were developed during the visioning workshop and subsequently refined at the planning charrette and concept workshop.

District Mission

To provide airfield operations, training, and support to tenant and transient aircraft in order to enhance mission readiness, support resilience, and unit cohesion while providing community amenities to Marines, Sailors, and their families

District Vision

To enhance Marine Corps and partners services mission by providing 24/7 secure operations, training, and support while utilizing the natural Hawaiian landscape for Service members and their families

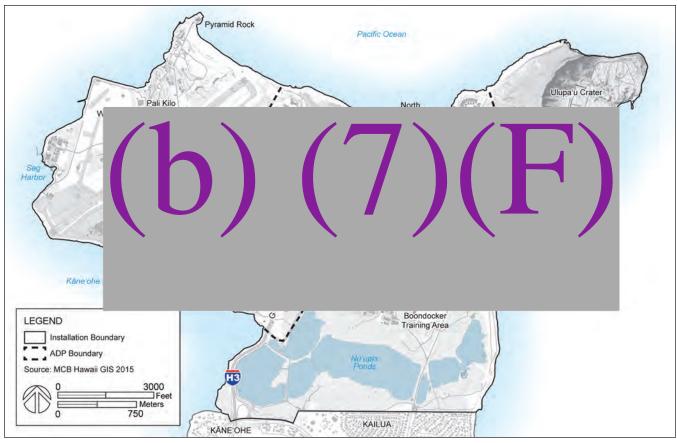


Figure 1-1 **District Location**

The planning goals of the Aviation District include the following.

- Improve land use to create future development opportunities.
 Functions that do not directly support aviation operations and can operate just as efficiently from another location should be relocated to support future aviation-related unit expansion.
- Improve vehicular and pedestrian network connections. The District was developed in the 1940s with narrow streets and few connected sidewalks, requiring pedestrians to share roads with vehicles.



- **Reuse existing facilities.** Modern and historic buildings can be reused to support administrative functions.
- Replace aging infrastructure. Many of the buildings in the district were constructed in the 1940s and are deteriorating and inefficient and should be recapitalized.
- Enhance community support facilities. The district includes desirable beaches and recreation areas but facilities and infrastructure are inadequate to meet the demand.

Specific planning objectives of the Aviation District ADP include the following.

- Identify space for aviation operation expansion
- Reuse Buildings 301, 1359, 1360, and 6468 (Finn Building)
- · Expand indoor fitness facility
- Relocate EOD operations outside of the runway primary surface
- Redevelop The Cabanas
- Construct a 3d Marines boat storage facility
- Construct a Marine Wing Support Detachment (MWSD) organizational parking lot
- Provide a district parking structures
- Provide sidewalks and multiuse paths
- Develop beach park amenities at Pyramid Rock



Marines with Marine Light Attack Helicopter Squadron 367 begin prepping a UH-1Y Huey helicopter for takeoff as two others fly in and prepare to land aboard Marine Corps Air Station Kaneohe Bay, Hawaii, May 6, 2014. Marine Aircraft Group 24 conducted a max launch of 11 total UH-1Y Huey and AH-1W SuperCobra helicopters assigned to HMLA-367 and CH-53E Super Stallion helicopters assigned to Marine Heavy Helicopter Squadron 463 in an effort to increase unit cohesion and camaraderie within the MAG. While HMLA-367 and HMH-463 conducted operations in the air, Marine Wing Support Detachment 24 and Marine Aviation Logistics Squadron 24 were on the ground to provide forward arming and refueling points, giving MAG-24 a chance to work as a whole. (U.S. Marine Corps photo by Lance Cpl. Matthew Bragg. www.mcbhawaii.marines.mil)

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2 Facility Requirements and Land

This section establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Aviation District ADP* is based.

2.1 Area Force Loading

2.1.1 MCB Hawaii Kaneohe Bay

Estimated personnel loading data for FY18 indicate MCB Hawaii Kaneohe Bay will have a total population over 18,000 people, as shown in Table 2-1. This includes the arrival of two MV-22B squadrons, the departure of three Navy P-3 squadrons, and the arrival of a rotational Navy P-8 detachment. This population is spread throughout the base districts.

Table 2-1 **Projected FY18 Force Loading for MCB Hawaii Kaneohe Bay**

OFFICER ¹	ER¹ ENLISTED¹ CIVILIAN		DEPENDENT ²	TOTAL
746	7,288	682	9,871	18,587

¹ Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY12 Facilities Support Requirements document, FY12 Navy Manpower Report, and FY18 projected Tables of Organization. Unit Deployed Program (UDP) personnel have been subtracted from these numbers.

2.1.2 Aviation District

The population within this district is comprised of personnel associated with the aviation units within Marine Aircraft Group 24 (MAG-24), Commander, Patrol and Reconnaissance Wing 2 (CPRW-2) (replaced by CPRW-10), other Navy aviation units (HSM-37, VR-51), and MCAS Kaneohe Bay operations. The CPRW-2 Headquarters building (Building 6468) will be vacated during the Navy's transition from P-3 squadrons located at MCB Hawaii Kaneohe Bay to rotational P-8A detachments. CPRW-2 is planning to be decommissioned by April 2017.

Population loading for the Aviation District:

- MAG-24 and subordinate units: approximately 1,900 total military
- MCAS: approximately 140 total military and 25 civilians
- Navy aviation units: approximately 1,140 total military and 20 civilians

Other personnel not directly associated with aviation missions include MCCS; MCB Hawaii Operations & Training; Installation, Environment, & Logistics; and the 4th Force Reconnaissance Company Detachment. Building 386 is the only bachelor quarters in the district and provides 36 units for U.S. Marine Corps Forces Pacific (MARFORPAC) band members who practice in the adjacent Building 374.

² Dependent personnel numbers have been derived using December 2012 Defense Manpower Data Center reports. Includes UDP personnel and their dependents.

2.2 Area Equipment Loading

Estimated equipment loading data was extracted from BFR documents for FY18. The following sections provide a synopsis of unit equipment at an aggregate level in the Aviation District.

2.2.1 Aircraft Loading

Permanent Marine Corps and Navy aircraft loading by unit are shown in Tables 2-2 to 2-4.

Table 2-2 MAG-24 Aircraft Loading

UNIT	AIRCRAFT TYPE	QUANTITY						
VMM-268 ¹	MV-22B	-(b) (7)(F)						
VMM-363 ²	MV-22B	(0) (1)(1)						
HMH-463	CH-53E							
UMI A 267	AH-1W/Z							
HMLA-367	UH-1Y							
VAALL 23	RQ-7B System (3 x aircraft EA)							
VMU-3 ³	MQ-21A System (5 x aircraft EA)							

¹Initial Operational Capability FY16

Table 2-3 MCAS Kaneohe Bay Aircraft Loading

UNIT	AIRCRAFT TYPE	QUANTITY
VMR Det	C-20G	(h) (7)(F)
		(b) (7)(F)
Table 2-4 Navy Aircraft	Loading	
UNIT	AIRCRAFT TYPE	
VR-51	C-20G	
VPU-2	P-3	
HSM-37	MH-60R	
P-8A Det	P-8A	

² Initial Operational Capability FY18

³ MQ-21A systems Initial Operational Capability 4th Quarter 2016, reading 9 systems by FY20

2.2.2 Major Equipment (Rolling Stock)

Major MAG-24 rolling stock equipment by unit is depicted in Table 2-5.

Table 2-5 MAG-24 Major Equipment (Rolling Stock) Loading

UNIT	NIT EQUIPMENT TYPE	
MALC 24	Maintenance vans	252
MALS-24	Aircraft and Ordnance support equipment	(b) $(7)(F)$
VMU-3	Rolling stock, fork lifts, utility and cargo trucks, trailers,	181
MWSD-24	heavy equipment, and attachments	128

2.3 Facility Requirements

Basic Facility Requirements for the Aviation District were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. Fuel-related requirements are generated by the Defense Logistics Agency Energy and not reported on Navy facility requirement summary plans, although fuel-related assets are included. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies in the Aviation District are presented in Table 2-6.

Table 2-6 Aviation District Facility Requirements (CCN 11110–CCN 12150)

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
11110	Runway/Fixed Wing	SY	177,778	(h) ((7)(F)
11115	Runway/Rotary Wing	SY	13,500	(0) ((
11120	Helicopter Landing Pad/Hoverpoint	SY	7,256		
11210	Taxiway	SY	176,700		
11320	Aircraft Parking Apron	SY	326,200		
11340	Aircraft Access Apron	SY	22,570		
11610	Aircraft Washrack Pavement	SY	4,090	0	(4,090)
11615	Aircraft Rinse Facility	SY	2,803	2,033	(770)
11620	Aircraft Compass Calibration Pad	SY	1,600	(h) ((7)(F)
11635	Arming and De-arming Pad	SY	15,600	(0) ((/)(1)
11640	Precision Approach Radar Pad	SY	355		
11645	Line Vehicle Parking	SY	1,445	0	(1,445)
11650	Towway	SY	4,200	(h)	(7)(F)
11656	Combat Aircraft Loading Area	SY	12,960	(0)	(1)(1)
11660	Fire and Rescue Vehicle Alert Pad	SY	200		
12110	Aircraft Direct Fueling Station	GM	0		
12120	Aircraft Truck Fueling Facility	GM	0		
12150	Aircraft Ready Fuels Storage	GA	0		

Table 2-6 Aviation District Facility Requirements (CCN 12220–CCN 14375)

Table 2-6	Aviation District Facility	y neq	an ements (ee	11 12220	CCIV 14373)
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
12220	Small Craft Fueling Station	GM	100	(h)	(7)(F)
12230	Small Craft Ready Fuel Storage	GA	0	(0)	(/)(1)
12310	Filling Station	0L	0		
12330	Vehicle and Equipment Ready Fuel Storage	GA	0		
12340	Ethanol ready Fuel Storage	GA	0		_
12510	POL Pipeline-Multiple Sites	LF	6		_
12516	POL Pipeline Pump Station and Ancillary Equipment	GM	1,000		
12520	Shed/Shelter for Pump Station and Ancillary Equipment	SF	600		
12630	Tank Truck or Tank Car Loading Facility	0L	0		
12640	Tank Truck or Tank Car Unloading Facility	0L	0		
13122	VHF/UHF Communications Facility	SF	653		
13325	Tactical Air Navigation Building	SF	300		
13335	Non-directional Beacon facility Building	SF	120		
13372	Military Terminal Radar Approach Control Facility	SF	13,200		
13375	Air Surveillance Radar Facility	SF	1,400		_
13440	Ground Control Approach System	EA	1		_
13456	Precision Approach Path Indicator System	EA	2		
14111	Air Passenger Terminal	SF	9,200	12,241	3,041
14112	Air Cargo Terminal	SF	7,966	7,966	0
14120	Aircraft Fire and Rescue Station	SF	31,940	(h)	(7)(F)
14140	Aircraft Operations Building	SF	12,637	(0)	(/)(1)
14142	Air Intelligence Support Center	SF	29,240		
14170	Control Tower	SF	3,000	3,843	843
14187	Liquid Oxygen/Nitrogen Facility	SF	5,074	(h)	(7)(F)
14324	Marine Corps Explosive Ordnance Disposal Facility	SF	14,210		(
14345	Armory	SF	8,012		
14375	POL Operations/Sampling/Testing Building	SF	3,800		

Table 2-6 Aviation District Facility Requirements (CCN 14377–CCN 21210)

	Aviation District Facility	,	(
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
14377	Operational Storage	SF	1,000	(h) ((7)(F)
14378	Operational Hazardous/Flammable Storage	SF	2,152	(0) ((
14910	Aircraft Revetment	EA	3		
14930	Aircraft Arresting Gear	EA	2		
14950	Blast Deflector Fence	EA	4		_
15140	Fueling Pier	FB	0		
15964	Waterfront Operations Building	SF	20,066	23,064	2,998
15966	Landing Craft Ramp	EA	2	(b) (7)(1	F)
17110	Academic Instruction Building	SF	6,100	2,897	(3,203)
17115	Navy and Marine Corps Reserve Training Building	SF	26,219	14,366	(11,853)
17120	Applied Instruction Building	SF	26,270	39,352	13,082
17135	Operational Trainer Facility	SF	36,250	30,320	(5,930)
17951	Fire Fighting and Rescue Training Area	EA	0	1	1
21103	Corrosion Control Hangar	SF	27,400	13,284	(14,116)
21105	Maintenance Hangar—OH Space	SF	287,000	415,372	128,372
21106	Maintenance Hangar—01 Space	SF	107,150	78,182	(28,968)
21107	Maintenance Hangar	SF	96,835	71,136	(25,699)
21108	Airframes Shop	SF	29,319	14,381	(14,938)
21110	Aircraft Overhaul and Repair Shop	SF	22,770	8,365	(14,405)
21116	Aircraft Intermediate Maintenance Management	SF	9,875	10,424	549
21121	Engine Maintenance Shop	SF	21,190	(h)	(7)(F)
21145	Avionics Shop	SF	27,775	(0)	(
21154	Aviation Armament Shop	SF	8,740		
21155	Aviation Armament Support Equipment Holding Shed	SF	11,300		
21175	Parachute and Survival Equipment Shop	SF	7,870		
21181	Engine Test Cell	SF	0		
21189	Power Check Pad Without Sound Suppression	EA	1		
21196	Maintenance Aircraft Spares/ Storage	SF	72,600		
21210	Guided Missile Integration Facility	SF	34,240		

Table 2-6 **Aviation District Facility Requirements** (CCN 21358–CCN 85210)

Tubic 2	Aviation District racint	, neq	an ements (ee	1121330	
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
21358	Boat Shop	SF	0	6,061	6,061
21368	Dive Shop	SF	250	5,143	4,893
21430	Refueling Vehicle Shop	SF	6,120	0	(6,120)
21440	Vehicle Holding Shed	SF	1,680	1,200	(480)
21451	Automotive Organizational Shop	SF	18,853	7,237	(11,616
21455	Vehicle Wash Platform	EA	7	3	(4)
21456	Grease Rack	EA	6	0	(6)
21820	Construction/Weight Handling Equipment Shop	SF	9,400	0	(9,400)
21860	Ground Support Equipment Shop	SF	12,500	15,960	3,460
21861	Ground Support Equipment Holding Shed	SF	19,500	14,784	(4,716)
31720	Electrical and Electronics Systems Laboratory	SF	0	(b) ((7)(F)
31725	Electrical and Electronics and Communication Systems INT Lab	SF	6,124		
41182	Contaminated Fuel Storage	BL	0		
42132	Inert Storehouse	SF	20,000		
42135	Ready Magazine	SF	1,020		
44112	Storage of Air or Ground Organic Units for Marine Corps	SF	56,505		
44130	Hazardous and Flammables Storehouse	SF	800		
44135	General Storage Shed	SF	3,895	0	(3,895)
61010	Administrative Office	SF	23,643	31,508	7,865
61071	Regimental Group Headquarters	SF	17,620	25,817	8,197
61072	Battalion Squadron Headquarters	SF	15,960	15,617	(343)
61073	Company Battalion Headquarters	SF	3,088	2,569	(519)
61074	Garrison Aid Station, Marine Corps	SF	9,510	(b) (7)((F)
72121	Transient Quarters—Mission Essential	PN	113	0	(113)
73013	Issue/Retail Clothing and Uniform Center	SF	6,400	4,867	(1,533)
74045	Fitness Room	SF	0	1,563	1,563
74081	MWR Rental Accommodation	SF	27,843	26,388	(1,455)
85210	Parking Area	SY	23,406	0	(23,406)

2.4 Developable Real Estate

During the planning process, areas throughout the 791-ac Aviation District were assessed for their ability to accommodate future development or redevelopment and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- **Potentially Developable:** Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Areas identified as Developable with Constraints include sites where existing facilities are outdated, in poor physical condition, or poorly sited. These sites provide opportunity for infill development. Infill development is the process of developing vacant or under-used parcels within areas that are already largely developed, and results in more compact development patterns, minimizes the need for new infrastructure (and may lower development costs due to proximity to existing infrastructure), and ensures that housing, work areas, and support services are close to one another. This approach supports MCB Hawaii's stated goals to create modern, efficient, and sustainable facilities and to consolidate functions. It also supports the goal of preserving land for training or recreational areas such as parks and greenspace. The potential availability of areas in the Aviation District for future development is shown on Figure 2-1.

2.5 District Assets

The primary operational asset in the Aviation District is Runway 4/22, which is used by fixed-wing aircraft and helicopters. Other assets include helicopter landing pads, aircraft parking aprons, hangars, various operational and maintenance support facilities, training areas, community support facilities, and recreational areas. One defining characteristic of the Aviation District is that it is surrounded on three sides by ocean, ensuring that off-base development will not encroach upon and restrict air operations in the future. Pyramid Rock beach, the Pali Kilo Cottages, and The Cabanas lodge—all located west of the runway—are popular recreational facilities. Major facilities and other landmarks are illustrated on the Aviation District Base Map (Figure 4-3) in Section 4.0, Base Maps.

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure, or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

Aviation District Area Development Plan

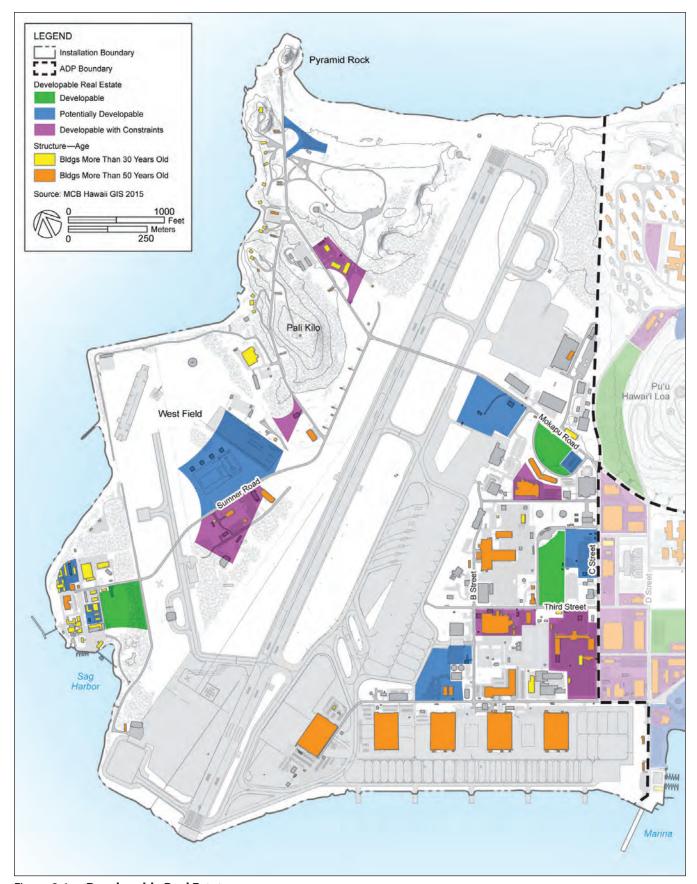


Figure 2-1 **Developable Real Estate**

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii installations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert) or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawai'i MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is MAG-24. The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal command functions/units do reside at various locations.

The following section provides details pertaining to specific land uses and functional relationships within the Aviation District.

3.2 Aviation District Functional Relationships

Figure 3-2 illustrates functional relationships between major land uses within the Aviation District, which support Marine Corps and Navy aviation requirements for aircraft listed in Section 2.0, Facility Requirements and Land. The primary land use is the runway environment, including the single runway, taxiways, aircraft parking aprons, and dedicated aircraft wash and rinse facilities. Facilities requiring immediate access to the runway/taxiways are depicted with direct connecting linkages. Department of Defense (DoD) airfield planning criteria—in particular, *UFC 3-260-01, Airfield and Heliport Planning and Design* (November 2008)—provide standardized criteria for the geometric layout, design, and construction of runways, helipads, taxiways, aprons, related permanent facilities—the navigable airspace surrounding these facilities—to meet sustained operations.

Other aviation-related facilities and functions, such as aircraft supply and bulk fuel storage do not need to be located in direct proximity to the runway or apron. However, these facilities should be located in close proximity for efficient and effective support of aviation administration and operations. Land use regulations should ensure non-aviation related facilities and functions do not encroach upon or constrain flight operations, support, or training. Facilities that do not have a direct or related link to the Aviation District's main purpose should be considered for relocation to other districts based on economic feasibility.

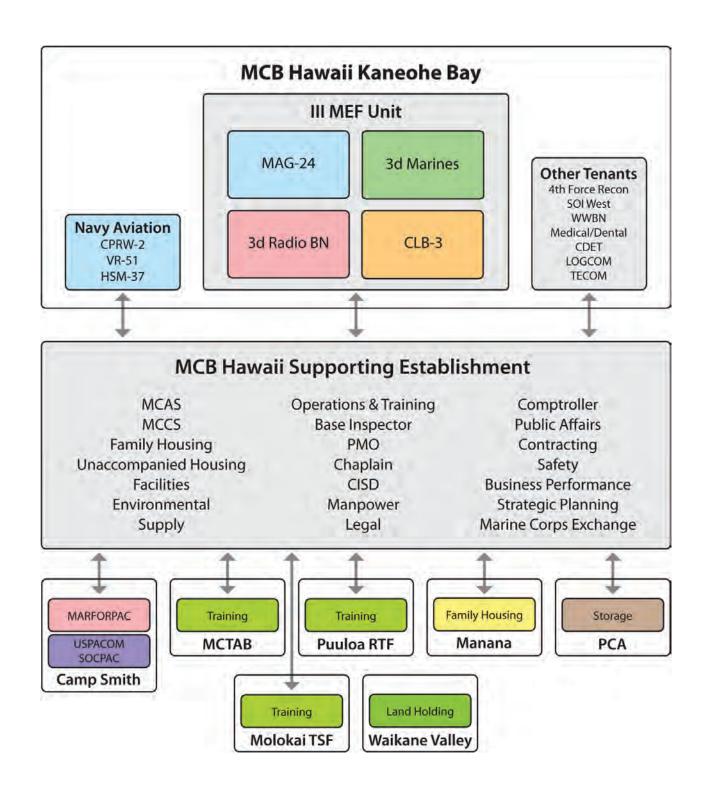


Figure 3-1 MCB Hawaii Functional Relationships

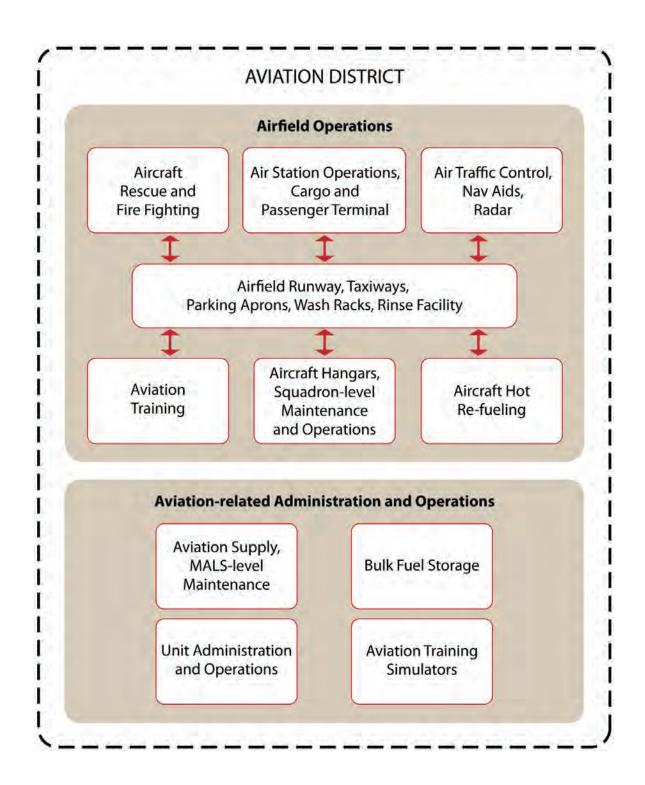


Figure 3-2 **Aviation District Functional Relationships**



4 Base Maps

Section 4 shows the Aviation District in the context of the neighboring Windward O'ahu community (Figure 4-1) and in relation to the other areas of MCB Hawaii Kaneohe Bay installation (Figure 4-2). Figure 4-3 highlights the major facilities and the physical geography of the district.

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Aviation District Area Development Plan

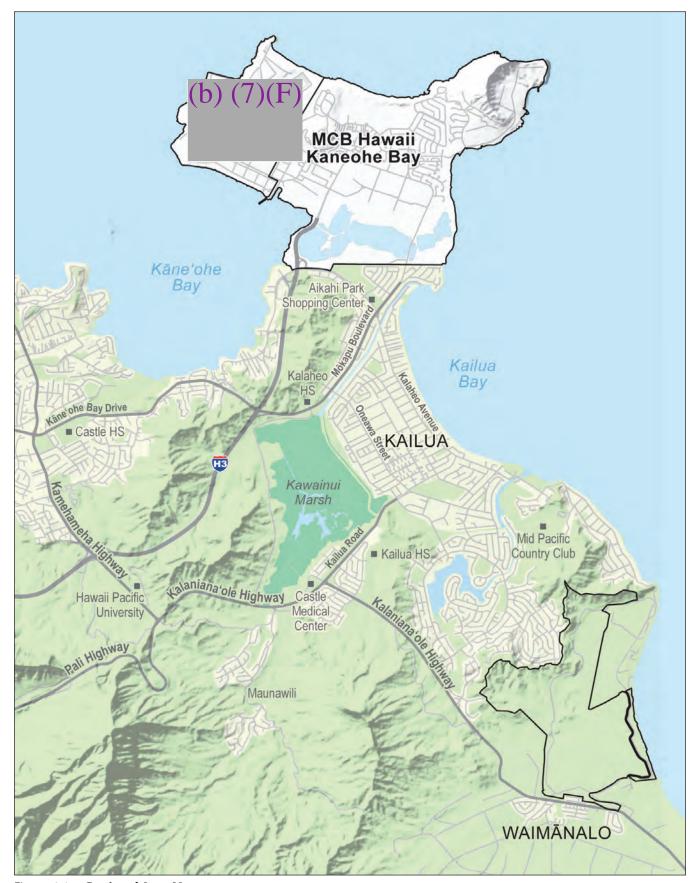


Figure 4-1 **Regional Area Map**

20 Section 4 | Base Maps FOR OFFICIAL USE ONLY

21

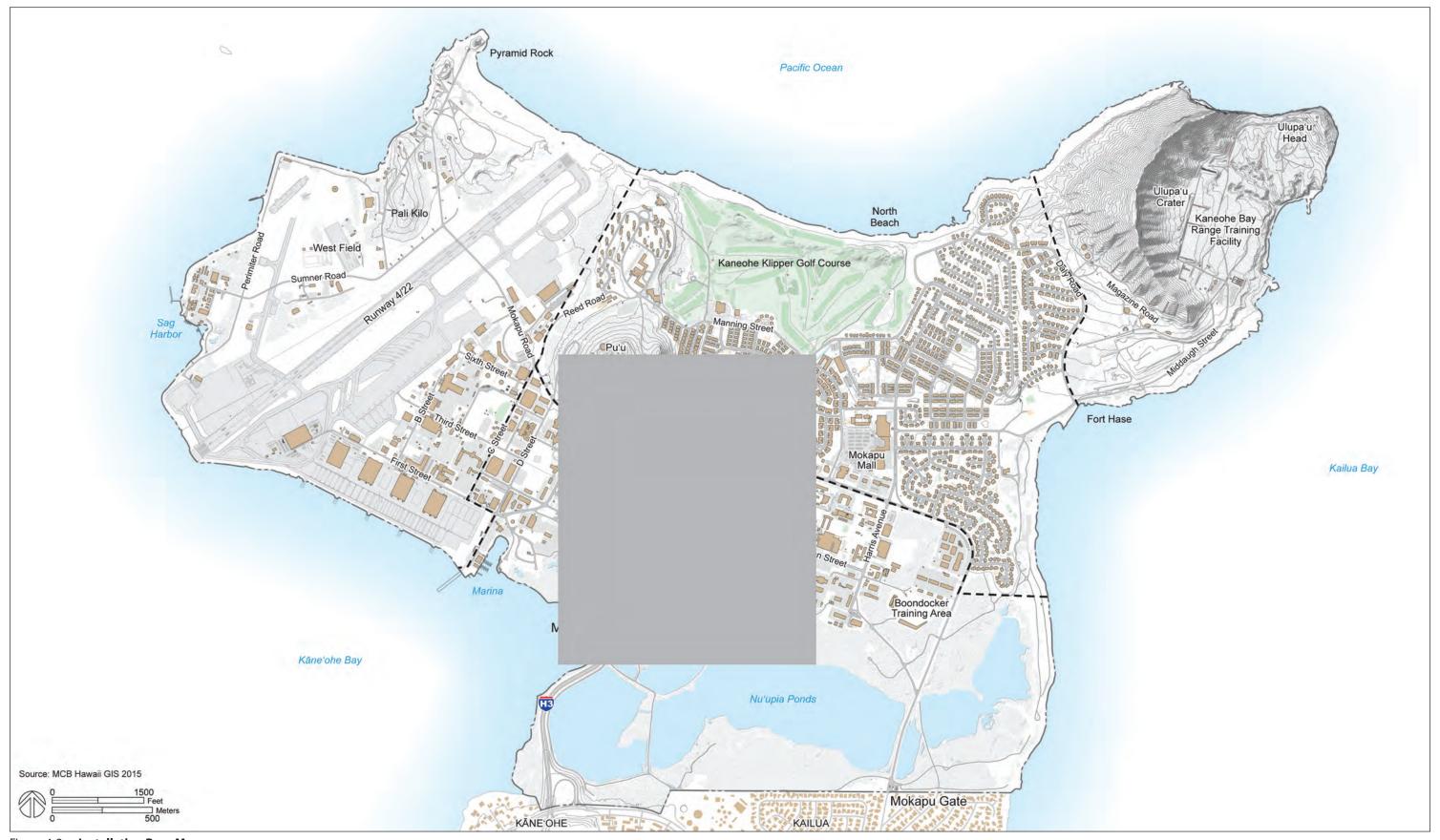


Figure 4-2 **Installation Base Map**



Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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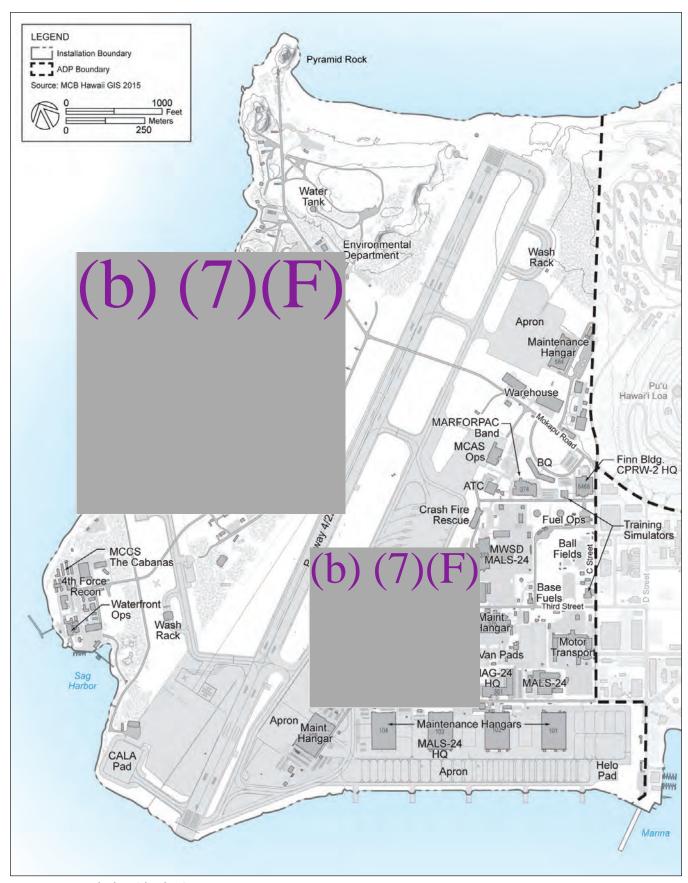


Figure 4-3 **Aviation District Base Map**

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Aviation District Area Development Plan



24 FOR OFFICIAL USE ONLY

5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, basic facility requirements, and Geographic Information System (GIS) and facility databases were all primary information sources contributing to the development of the *Aviation District ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating in the district. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

U.S. Marine Corps. Marine Aviation Plan. 2015.

The Aviation Plan was prepared under the authority of Marine Corps Deputy Commandant for Aviation and covers the topics of the Marine Corps Operational Landscape, Expeditionary Aviation Program and Concepts, and the Marine Aviation Organization and Enterprise. A *Marine Aviation Almanac* is also provided.

U.S. Marine Corps Community Services. PVA for Self-Storage Facility. Draft Report. Prepared by AECOM. October 2014.

This study assesses the feasibility of a self storage facility for Marine Corps Community Services at MCB Hawaii Kaneohe Bay. Four build options were evaluated based on market data, site, conceptual design, cost and financial feasibility. The study recommends that MCCS consider Option 1, on a site on Palikilo Road. This option provides the maximum amount of necessary climate-controlled storage for the MCB Hawaii community, will have a project cost of \$9.65 million. It is, however, the most expensive of the four options evaluated.

Marine Corps Base Hawaii. Marine Corps Base Hawaii Kaneohe Bay Parking Study, Final Report. Prepared by Belt Collins Hawaii, Weslin Consulting. August 2014.

The parking study analyzed the installations's parking assets and requirements, and identified areas with parking surpluses and deficits. Strategies were developed to provide for the growing need for parking.

Aviation District stakeholders included representatives from the following units and departments.

MCB Hawaii Leadership and Administration

Marine Forces Pacific

Marine Corps Installation Command

Marine Corps Air Station at Kaneohe Bay

Marine Aircraft Group 24

Marine Aviation Logistics Squadron 24

Marine Wing Support Detachment

Commander, Patrol and Reconnaissance Wing 2

4th Force Reconnaissance Company

Operations & Training Department

Explosive Ordnance Disposal

Unaccompanied Personnel Housing Department

Facilities Department

Motor Transportation Department

Public Works Department

Environmental Department

Fuels Department

Marine Corps Community Services

Energy Department

Naval Facilities Engineering Command Pacific

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Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities, and other planning documents and metrics.

Naval Facilities Engineering Command, Pacific. Drainage Study for Area B—First Street, B Street and C Street, Marine Corps Base Hawaii, Kaneohe Bay. April 2014.

This study analyzed specific storm drainage conditions in the industrial area of Marine Corps Base Hawaii. It analyzed drainage systems along First Street (Hangar 104 to D Street), B Street (Third Street to First Street), C Street (Sixth Street to First Street), Second Street (C Street to D Street), and D Street (Fourth Street to First Street outfall). The study identifies deficiencies and recommends improvements for this area.

U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The Optimization Study was prepared in response to an ongoing DoD process to evaluate the realignment of forces in the Pacific Region. The study identifies development opportunities that may be used to satisfy long-term requirements associated with relocation of units from Okinawa under the Defense Policy Review Initiative.

Marine Corps Base Hawaii. Base Exterior Architectural Plan. Draft. December 2013.

The Base Exterior Architectural Plan presents both recommendations and guidelines to establish proper and consistent visual design of buildings and sites at MCB Hawaii Kaneohe Bay. The document analyzes existing base conditions and presents requirements and guidelines on site planning, landscape design, roadway design, architecture, and signage.

Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Utility System Capacity Study, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared by Helber Hastert & Fee Planners and HDR Engineering, Inc. October 2013.

The primary objective of this study was to determine the overall impacts of proposed military construction (MILCON) and non-appropriated funds projects in the flight line area on water and wastewater systems. The evaluation area was limited to the area bounded by D Street, Reed Road and the west boundary of the flight line area along Sumner Road and Perimeter Road. The study recommended water and wastewater improvement projects to upgrade and correct service deficiencies at the flight line.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Pacific Division. Final Marine Corps Base Hawaii Warehouse Study. Prepared by Belt Collins Hawaii LLC. June 2012.

The purpose of this study was to evaluate existing warehouse and supply conditions at MCB Hawaii. The study found that warehouse facilities are not optimized for space usage, primarily due to "stovepipe" management, where each unit has direct control of material needs. This results in operational effectiveness but also unnecessary laydown space. Additional storage requirements were projected. To correct existing inefficiencies, the plan proposes to utilize modern technologies, optimize existing facilities, consolidate like users, and construct a new warehouse.

Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. May 2013.

The environmental assessment (EA), prepared in accordance with the National Environmental Policy Act, evaluates a proposal to provide suitable sites on DoD installations in Hawai'i to a private entity for the installation and operation of photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on DoD installations on O'ahu and Kaua'i.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Hawaii Division. Bicycle Route Planning Study for Marine Corps Base Hawaii Kaneohe Bay. Prepared by Belt Collins Hawaii LLC et al. December 2012.

MCB Hawaii Kaneohe Bay seeks to encourage alternative modes of transportation within the base, particularly bicycling. This study included an extensive user survey and identified and evaluated four alternative approaches to implementing a bikeway system to meet user demands and encourage ridership. The recommended alternative proposes a bikeway system using bike routes, bike lanes, bike paths, and shared use paths.

Department of the Navy. Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii. Volumes I and II. June 2012.

The environmental impact statement assessed potential environmental impacts associated with the proposed basing of MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. The introduction of these aircraft in Hawai'i is part of the Marine Corps' plan to restructure and rebase its forces in the Pacific over the next 10 years.

Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

The INRMP provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (INRMP 2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments

(SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

NAVFAC Pacific. Traffic Impact Report for the Marine Aviation Plan to Locate MV-22 and HMLA Squadrons at MCB Hawaii Kaneohe Bay, Kaneohe, Hawaii. Prepared by Julian Ng, Inc. September 2011.

The report looked at the traffic impacts of locating MV-22 and HMLA squadrons at MCB Hawaii Kaneohe Bay, which will increase the number of personnel on base. Recommendations for roadway improvements were identified to address existing and future traffic conditions, which are expected to be increasingly undesirable.

Naval Facilities Engineering Command (NAVFAC) Pacific. Electrical Utility System Assessment MCB Hawaii, Kaneohe, Hawaii. March 2011.

The purpose of the Electrical Utility System Assessment was to review the power requirements of future MILCON projects and assess their impact on the MCB Hawaii Kaneohe Bay primary electrical distribution system. The entire system was surveyed and existing capacity, condition, and reliability were assessed.

Naval Facilities Engineering Command, Pacific Division. Air Installations Compatible Use Zones (AICUZ) Study Update, Marine Corps Base Hawaii Kaneohe Bay. Prepared by Wil Chee-Planning & Environmental. Final Draft. July 2009.

This is an update of the 2003 AICUZ study for MCAS Kaneohe Bay. It includes an updated noise study evaluating both baseline (2007) and future noise conditions (circa 2017). Future conditions reflect the proposed transition of aircraft at MCB Hawaii, specifically the replacement of the majority P-3 aircraft with P-8A, and replacement of three squadrons of CH-53D aircraft with one CH-53E and two squadrons of MV-22 Osprey tiltrotor aircraft. The AICUZ is a planning tool to ensure future planning actions are compatible with the anticipated noise environment.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

The Master Plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

6 ADP Area Analysis

Section 6, ADP Area Analysis, presents the regional, offsite, and onsite conditions related to the Aviation District. Section 6.1, Regional Context, describes the neighboring civilian community. Section 6.2, Offsite Conditions, describes the general physical characteristics of MCB Hawaii Kaneohe Bay. Section 6.3, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resources constraints within the Aviation District. Plan alternatives for the Aviation District were developed and evaluated, and a recommended Area Development Plan is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Aviation District is located within the boundaries of MCB Hawaii Kaneohe Bay, located on Mōkapu Peninsula on the windward side of Oʻahu. Mōkapu Peninsula is bordered by Kāneʻohe Bay on the west, Kailua Bay to the east, and the Pacific Ocean to the north. On its south side, MCB Hawaii Kaneohe Bay abuts civilian lands, including a residential neighborhood of Kailua town, a City and County of Honolulu wastewater treatment plant, and portions of Kāneʻohe town. The combined population of the Kāneʻohe/Kailua region is approximately 82,750 residents, with approximately 44,100 residing in Kāneʻohe and 38,650 residing in Kailua (U.S. Census 2010). Both Kailua and Kāneʻohe are primarily residential bedroom communities that include regional commercial, civil, and medical services.

Windward Oʻahu is separated from the more densely populated and urbanized city of Honolulu by the Koʻolau mountain range. Access to MCB Hawaii Kaneohe Bay from downtown Honolulu is available via three highways that tunnel through the Koʻolau mountain range—the Likelike Highway 63, Pali Highway 61, and John A. Burns H-3 Freeway. City and County of Honolulu bus stops are located within walking distance of the Main and Mokapu gates. Oahu Transit Services provides county bus service to MCB Hawaii Kaneohe Bay. Regular off-base service is provided by Route 56 with multiple stops located within walking distance of the Main and Mokapu Gates. On-base service is provided by Route 70 five times daily between 0750 and 1400.

See Section 4, Figure 4-1, Regional Area Map, for a map showing the Aviation District in the context of windward O'ahu.

6.2 Offsite Conditions

This section describes the general physical characteristics of the entire MCB Hawaii Kaneohe Bay installation.

6.2.1 Geology

The Mōkapu Peninsula was formed by basaltic lava eruptions from four separate volcanic vents during the last period of volcanic activity on Oʻahu. Major volcanic features of the peninsula include Kuʻau or Pyramid Rock on the northwestern tip of the installation, Puʻu Hawaiʻi Loa in the central area, and Ulupaʻu Crater on the northeastern tip.

Following this volcanic activity, the peninsula was inundated by a rise in sea level, during which time an extensive coral reef was formed. As sea level retreated to its present level, beaches and sand dunes were formed from the deposition of calcareous sand by the prevailing tradewinds. Approximately 280 ac of coral fill were added to the peninsula's marshy central drainage basin between 1939 and 1941 to both deepen the sea channel for marine vessels and create a runway (Department of the Navy 2006).

6.2.2 Topography

Topography at MCB Hawaii Kaneohe Bay generally slopes toward the Nu'upia Ponds, with coastal areas sloping toward the shores. The three volcanic highpoints Pyramid Rock, Pu'u Hawai'i Loa, and Ulupa'u Crater are at elevations of approximately 75 ft, 330 ft, and 665 ft above mean sea level (msl), respectively. Within the Aviation District, topography is generally flat, except the northern most area of the district near Pali Kilo and Pyramid Rock.

6.2.3 Hydrology

The Mokapu Central Drainage Channel is a lined stream channel that runs through much of the base and empties into the Nu'upia Ponds Wildlife Management Area and ultimately into Kāne'ohe Bay. Several watershed improvement projects have been conducted over the years in the vicinity of the drainage channel to remove invasive weeds and replace them with native plants. These wetland and watershed projects have increased storm water retention capacity, reduced sedimentation into the Nu'upia Ponds and Kāne'ohe Bay and improved water quality. The projects have also created a more aesthetically pleasing environment and improved habitat for native waterbirds.

There are approximately 131 ac of U.S. Army Corps of Engineers jurisdictional wetlands at MCB Hawaii Kaneohe Bay covering five sites. The largest concentration of wetlands are in and around the Nu'upia Ponds Wildlife Management Area. Pockets of wetland are located within the golf course, next to the salvage yard, and at West Field.

6.2.4 Soils

Soil types identified at MCB Hawaii Kaneohe Bay range from clay to fine beach sand and are shown on Figure 6-1. The majority of soils on the installation consist of well-drained soils developed from coral, lava and/or alluvium, which provide a solid foundation for construction. Makalapa Clay (MdB, MdC), a prominent soil type around the slopes of Ulupa'u Crater, has high expansion

and contraction potential that makes it poor for construction purposes. Soils associated with Rock Land (rRK) have similar expansion and contraction characteristics.

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild tradewinds, while winter has higher rainfall, cooler temperatures, and stronger tradewinds. The predominant wind direction in the Hawaiian Islands is from the east–northeast at 10 knots.

In the vicinity of MCB Hawaii Kaneohe Bay, the median annual rainfall is approximately 40 in. Monthly average low and high temperatures at MCB Hawaii Kaneohe Bay range from 76 to 85 degrees Fahrenheit in the warmest month (September) and from 69 to 79 degrees Fahrenheit during the coolest month (January).

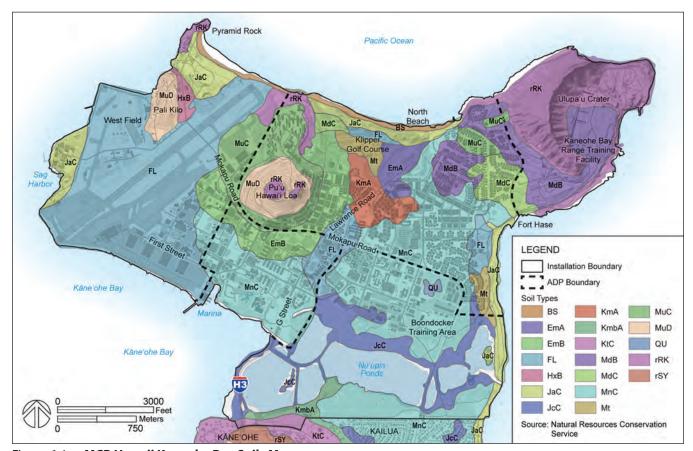


Figure 6-1 MCB Hawaii Kaneohe Bay Soils Map

6.2.6 Vegetation

Most of the developed land and open space at MCB Hawaii Kaneohe Bay contains planted landscape material, typically Bermuda grass and a variety of native and nonnative planted trees and shrubs. The nonmanaged dry land vegetated areas, including around Pu'u Hawai'i Loa and Ulupa'u Crater, are dominated by nonnative *koa haole* (*Leucanena leucocephala*) shrubland. Undeveloped shoreline areas include native sea strand vegetation.

According to the INRMP (2011), since 2008, natural resources staff have discovered several 'ōhai (Sesbania tomentosa) plants in the dune vegetation next to the shearwater colony on the Kailua Bay side of the installation. 'Ōhai is listed as a federal endangered species. The plants have been placed in custom built cages to protect them from rodents, and the area is monitored regularly by MCB Hawaii environmental staff. There are no other natural occurrences of plants currently listed or pending listing as endangered under the Federal Endangered Species Act (MCB Hawaii 2011 and Department of the Navy 2006).

6.2.7 Wildlife Habitat

There are two designated wildlife management areas (WMA) at MCB Hawaii Kaneohe Bay: the 482-ac Nu'upia Ponds WMA and the 23-ac Ulupa'u Head WMA. The Nu'upia Ponds WMA provides habitat for endemic, endangered water birds, shorebirds, and seabirds, and provides refuge to 16 native fish species. The Ulupa'u Head WMA is one of two red-footed booby or 'Ā (Sula sula rubripes) colonies in the main Hawaiian Islands. Although not a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many of the same waterbirds, shorebirds, and seabirds.

Endangered Hawaiian water bird species that feed and breed at MCB Hawaii Kaneohe Bay include the endemic Hawaiian duck or *koloa maoli* (*Anas wyvilliana*), the endemic Hawaiian coot or *'alae ke'oke'o* (*Fulica americana alai*), the endemic Hawaiian moorhen or *'alae 'ula* (*Gallinula chloropus sandvicensis*), and the endemic Hawaiian stilt or *ae'o* (*Himantopus mexicanus knudseni*). The Newell's shearwater or *'a'o* (*Puffinus auricularis*) is a federal-listed threatened species that has been observed in the area. The endemic short-eared owl or *pueo* (*Asio flammeus sandwichensis*) is included on the state list of endangered species and has also been observed in the area.

The waters off MCB Hawaii Kaneohe Bay are home to four federal-listed endangered species of animals, including the endemic Hawaiian monk seal or 'ilio holo i ka uaua (Neomonachus schauinslandi), the sperm whale (Physeter catodon), the migratory humpback whale or koholā (Megaptera novaeangliae), and the migratory hawksbill sea turtle or 'ea (Eretmochelys imbricata). The green sea turtle or honu (Chelonia mydas) is a federal-listed threatened species that has been observed in the area (MCB Hawaii, 2011).

6.3 Onsite Conditions

The Aviation District is located at the western end of the Mōkapu Peninsula, surrounded on three sides by the waters of Kāne'ohe Bay, and contains the installation's runway and primary aviation facilities. The eastern side of the Aviation District abuts two other planning districts—the Base Support District, which houses most the MCB Hawaii administration and base support facilities, and the Community Support District, where most of the family housing and community support facilities are located. A large crater or *pu'u*, known as Hawai'i Loa, lies on the border of the Aviation District. In the area south of the *pu'u*, C Street defines the eastern border of the Aviation District.

6.3.1 Land Use

Figure 6-2 illustrates land use within the Aviation District, which is dominated by the single runway airfield and associated taxiways, parking aprons, hangars, maintenance shops, equipment storage, and administrative facilities. Community support areas include vacation cottages and cabanas, a camping area, and Pyramid Rock beach. Lands within this district and the bordering nearshore waters are under the direct control of the federal government and are not subject to any state or county land use controls or public access entitlements.

6.3.2 Transportation Network

Figure 6-3 shows the transportation network and major parking areas within the Aviation District. The district is a major work site at MCB Hawaii Kaneohe Bay, and traffic volumes, especially along First Street, regularly peak during the morning and afternoon hours. The roadways between First Street and Mōkapu Road are narrow and frequently used by large vehicles and heavy equipment. There are sidewalks along First and Third Streets; however, there are no sidewalks along B and C Streets for pedestrians to safely move north—south through the district. Access to West Field requires crossing the runway on Mōkapu Road. During aircraft takeoffs and landings, vehicular traffic is stopped; pedestrian and bicycle traffic is prohibited at all times.

Lack of POV parking is a major issue in the Aviation District. The Marine Corps Base Hawaii Kaneohe Bay Parking Study (May 2014) identified a shortfall of 396 stalls associated with the flight line operations around First Street. Due to this shortfall, POV currently park on the apron between the maintenance hangars and have direct access to the airfield. (b) (7)(F)

(b) (7)(F)

Aviation District Area Development Plan

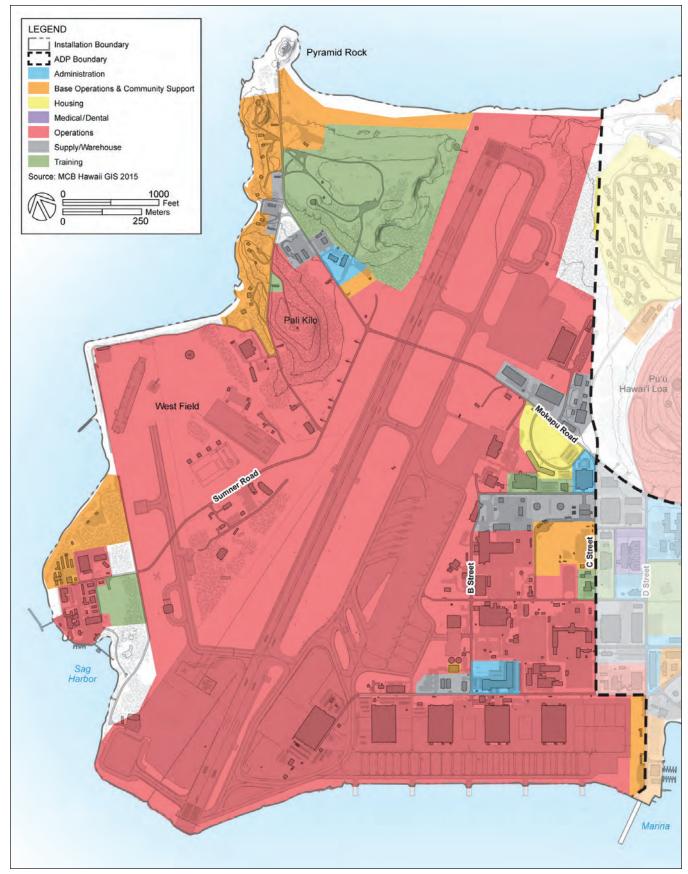


Figure 6-2 **District Land Use Map**

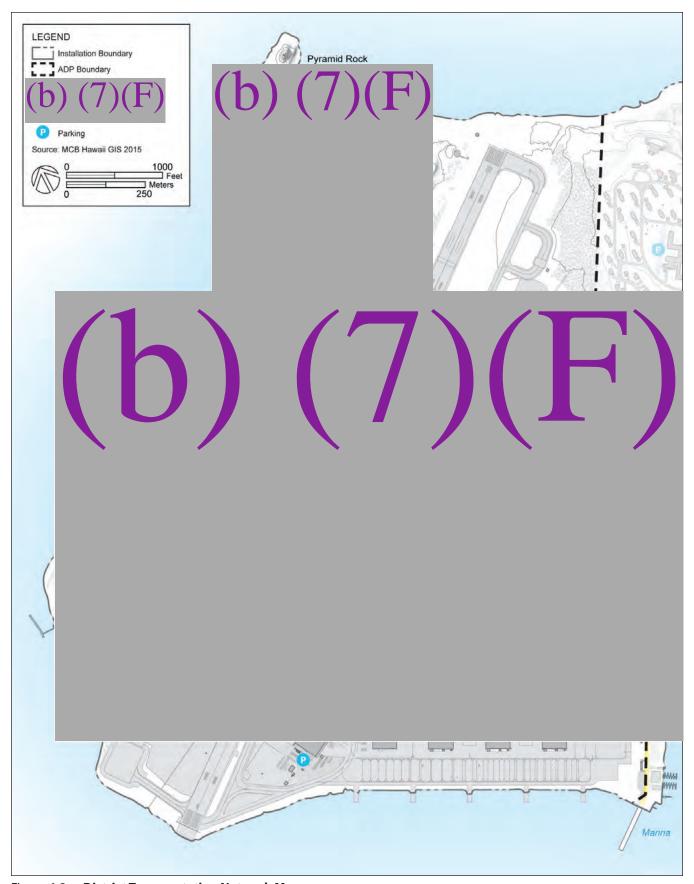


Figure 6-3 **District Transportation Network Map**

6.3.3 Utilities

This section provides an overview of the water, wastewater, electrical, storm drainage and communication systems at MCB Hawaii Kaneohe Bay and highlights utility issues specific to the Aviation District.

Water System

Figure 6-4 illustrates the water distribution system in the Aviation District. In general, the water supply, distribution, and storage capacity at MCB Hawaii Kaneohe Bay is adequate for existing and future needs in the Aviation District, except as noted below.

The Aviation District is served by the MCB Hawaii Kaneohe Bay water system, which is operated and maintained by the MCB Hawaii Facilities Department Maintenance Division. The potable water distribution system includes approximately 240,000 ft of water lines, two pump stations, five reservoirs, altitude valves, sectional valves, service valves, pressure regulating valves, fire hydrants, water meters, and a chlorination and fluoridation facility. Water comes

(b)
$$(7)(F)$$

BWS is under contract to provide 5,200 gallons per minute at 60 pounds per square inch (psi); however, actual service since 1999 has ranged from 100 to 110 psi. Daily water use measures approximately two million gallons per day with adequate pressure for all existing general uses. (b) (7)(F)

(b) (7)(F)

needed. The capacity of the transformer supporting this facility limits the number of pumps that can operate at the same time, thereby limiting the amount of water pressure the installation can organically generate. If BWS delivery pressure decreases to approximately 90 psi, the existing pumps are not adequate to meet the water requirements of the newly constructed flight line facilities. In addition,

(b) (7)(F)
(b) (7)(F) here are no potable water wells on MCB Hawaii Kaneohe Bay.

Wastewater System

Figure 6-5 shows the wastewater collection system in the Aviation District. The wastewater collection system is generally adequate to support an increase in population, although future sewer line upgrades and pump station capacity upgrades may be necessary depending on the location of proposed development.

The MCB Hawaii wastewater collection system is operated by the MCB Hawaii Facilities Department. The wastewater collection system is comprised of approximately 920 manholes, 171,800 ft of gravity sewers and force mains, and 20 pump stations. Wastewater is collected and conveyed to the base Water Reclamation Facility (WRF) located west of the main gate (Base Support District), which is a secondary biological treatment plant. Some treated

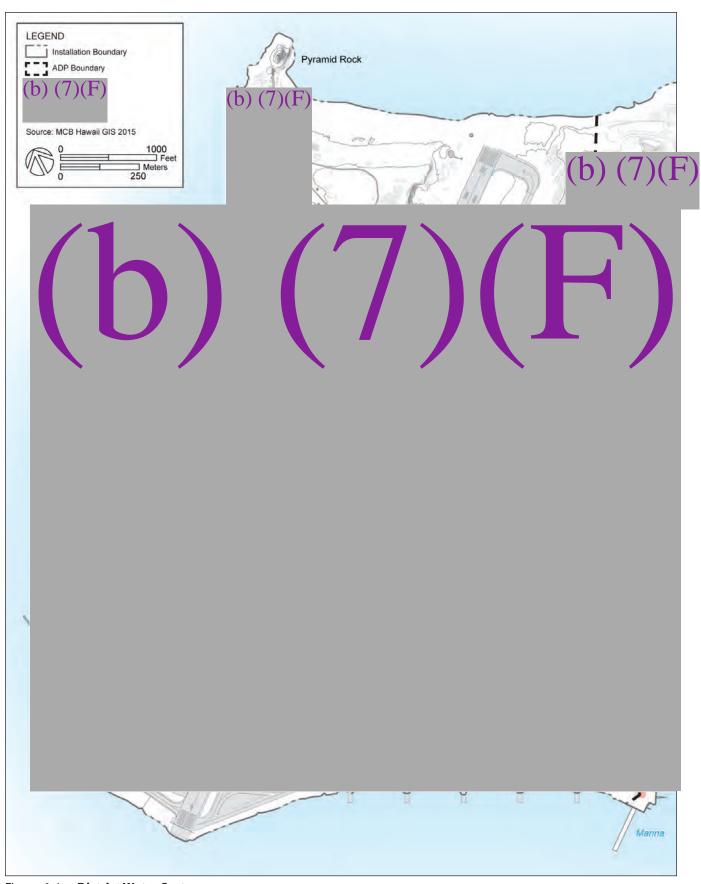
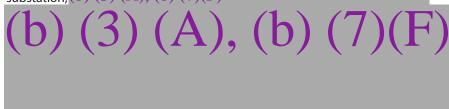


Figure 6-4 **District Water System**

R2-quality effluent is typically pumped to the Kaneohe Klipper Golf Course for irrigation while the rest is routed to the City and County of Honolulu Kailua Wastewater Treatment Plant for discharge through the Mōkapu deep ocean outfall under a National Pollutant Discharge Elimination System permit from the State of Hawai'i Department of Health (DOH) (HHF Planners 2013).

Electrical System

Figure 6-6 shows the electrical distribution system in the Aviation District. MCB Hawaii Kaneohe Bay is served from the 37.5 megavolt ampere (MVA) Hawaiian Electric Company (HECO) Mokapu Substation located near the main gate and is connected to both the Koolau–Aikahi (46 kV) and Koolau–Kailua (46 kV) HECO circuits. The Mokapu Substation steps down the incoming voltage to 11.5 kV, which is fed to the MCB Hawaii Main Substation (Building 5092). From the main substation, (b) (3) (A), (b) (7)(F)



In 2013, a final EA and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV in nonfamily housing areas in partnership with NAVFAC Hawaii. Sites approved for PV installation in the Aviation District are also shown on Figure 6-6.

Communications Infrastructure

Communication infrastructure is located in underground conduits across the installation. (b) (3) (A), (b) (7)(F) (b) (3) (A), (b) (7)(F)

Stormwater Management System

The MCB Hawaii Kaneohe Bay storm drainage system includes box culverts, drainage pipelines and ditches as shown on Figure 6-7. Over 20 storm drain outlets discharge into Kāne'ohe Bay, Kailua Bay, and Nu'upia Ponds. Water pools along 1st Street and B Street during storm events in the Aviation District.

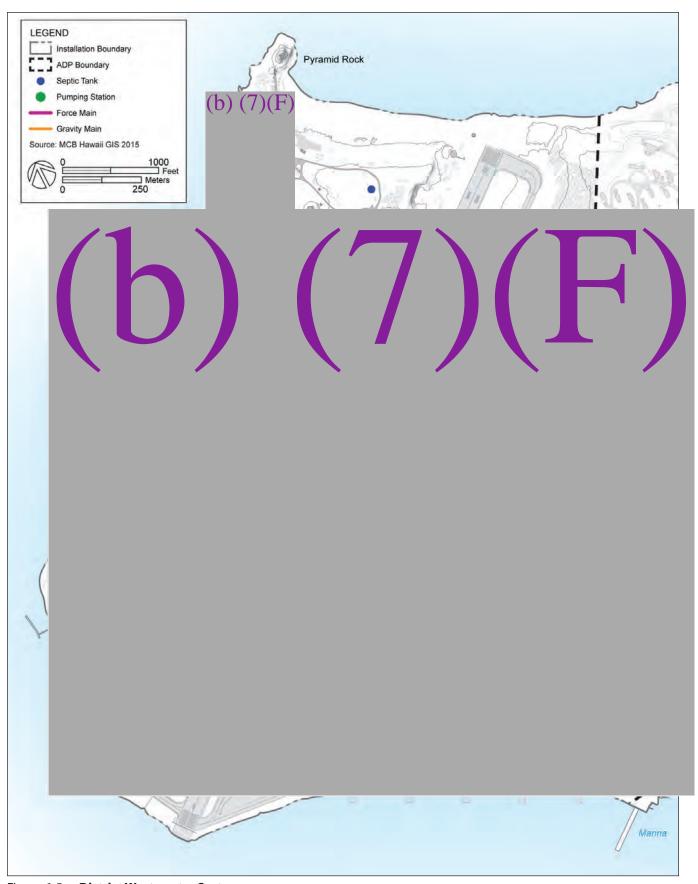


Figure 6-5 **District Wastewater System**

Aviation District Area Development Plan

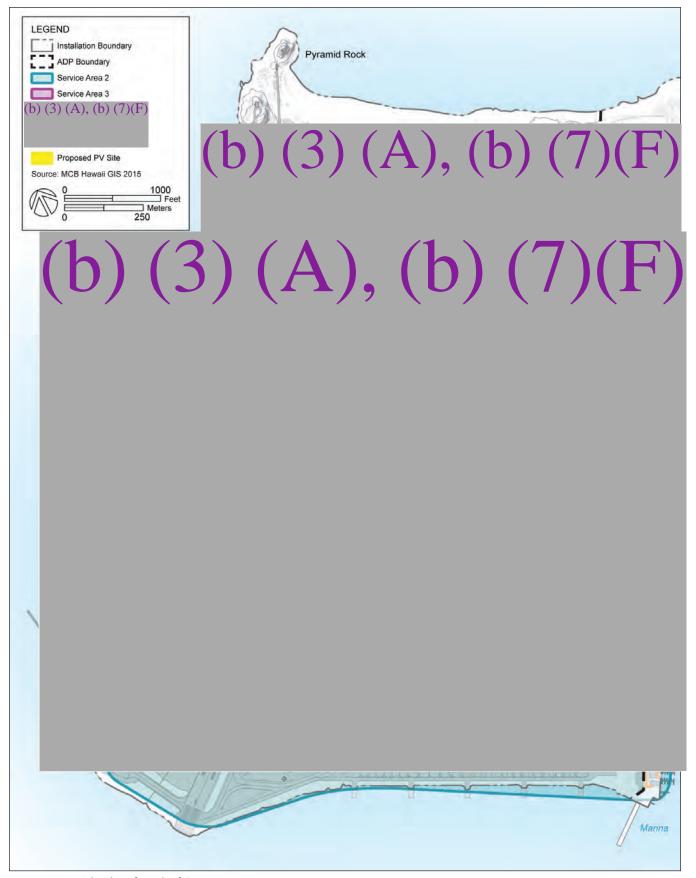


Figure 6-6 **District Electrical System**

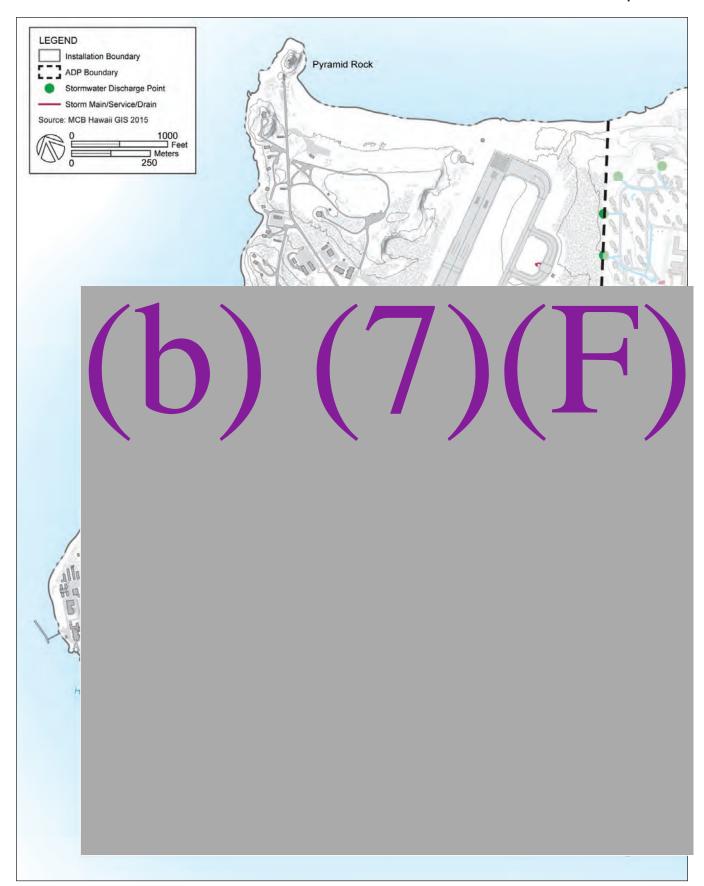


Figure 6-7 **District Storm Water Management System**

Solid Waste Disposal

MCB Hawaii provides solid waste collection and disposal for administrative, industrial, military, commercial, and bachelor quarters areas of MCB Hawaii Kaneohe Bay. Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupa'u Crater. Waste amounting to approximately 5,000 tons per year is placed in the landfill. At the present rate of waste generation, the landfill site should accommodate MCB Hawaii Kaneohe Bay's requirements for another 10–20 years, provided there are no changes in current regulations, and cover material is readily available. However, the Environmental Department is currently conducting a study to evaluate permanently closing the landfill prior to it reaching capacity. A commercial contract service collects solid waste from public–private venture (PPV) family housing areas for disposal at off-base facilities.

6.3.4 Environmental Conditions and Hazards

Figure 6-8 highlights specific environmental resources and hazards found in the Aviation District.

Installation Restoration Program Sites

Installation Restoration Program (IRP) sites are locations where releases of hazardous materials or petroleum products require remediation or other follow up efforts. Environmental remediation is completed under the MCB Hawaii IRP. There are two sites in the Aviation District where further action is recommended—a fuel farm sludge disposal area and a JP-5 fuel tank spill (Tank 1253).

Flood Plain

Portions of West Field and Pyramid Rock beach are susceptible to flooding from both storm surf and rainfall. Areas shown as flood zone AE have a one percent annual chance of flooding from rainfall; areas shown as flood zone VE have a one percent or greater annual chance of flooding from storm waves. Permanent structures constructed in these zones are required to have base floor elevations that range from two to sixteen feet above mean sea level.

Wetland

Two small wetland areas have been identified at West Field. A 100-ft setback helps to maintain the natural vegetation cover and prevents development encroachment.

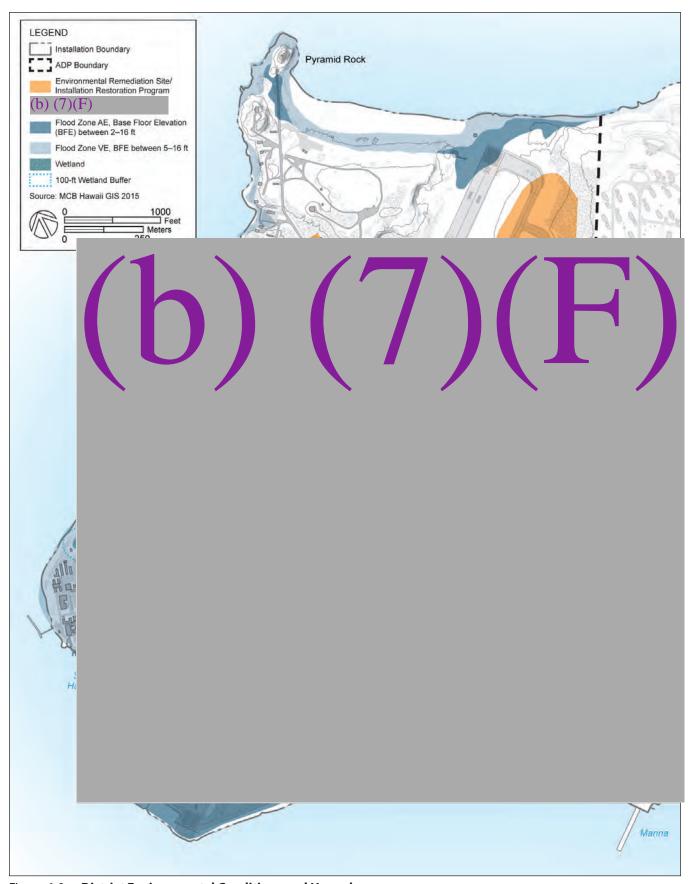


Figure 6-8 **District Environmental Conditions and Hazards**

6.3.5 Archaeological and Historic Architectural Resources

Figure 6-9 shows the archaeological and historic architectural resources in the Aviation District.

Archaeological Resources

A major pre-contact archaeological site along the northern coast of the Aviation District is the Mōkapu Burial Area (Site 50-80-11-1017), which was listed on the National Register of Historic Places (NRHP) in 1972. The Mōkapu Burial Area encompasses most of the northern shoreline of MCB Hawaii Kaneohe Bay, extending approximately 0.9 mi from Pyramid Rock on the west to the base of Ulupa'u Crater on the east. An inventory of Native Hawaiian remains from the area identified at least 1,582 distinct individuals which have been repatriated although not reburied (Department of the Navy 2014). The NRHP nomination form describes the site as having "provided the best source of scientific data on noncave burials in all of Hawaii."

In the Aviation District, 14 historic era and traditional Hawaiian sites at Pali Kilo in the northwest corner of the peninsula are eligible for listing on the NRHP as a historic district. The complex consists of the remains of early 20th century house sites that were formerly part of a 350-lot residential subdivision dating from 1932 to 1941. The NRHP nomination form states that the Mōkapu house lots are important because of their association with the increasing settlement of the Kāne'ohe area, beginning about 1921 with the paving of the Pali Road and continuing through World War II (WWII). These structures represent a historic period when people moved out of urban Honolulu to residential subdivisions along the south and windward sides of O'ahu. The houses also represent some of the last nonmilitary construction on the Mōkapu Peninsula (Department of the Navy 2014).

In addition to the 20th century features of the district, there are several traditional Hawaiian sites (pre-Contact and early 19th century) that are significant, including the possible remains of a *heiau* (temple), shrines, habitation sites, and other sacred sites.

Historic Architectural Resources

In 1939, the Mōkapu Peninsula area became known as Naval Air Station (NAS) Kaneohe, and it gained historic significance throughout WWII and the Cold War. On December 7, 1941, the naval air station was among the first military installations to be hit during the Japanese attack on Oʻahu. With the onset of the war, the U.S. government acquired more land on the peninsula and military facilities were greatly expanded.

In 1987, several facilities in the southern portion of the Aviation District were designated by the Secretary of the Interior as a National Historic Landmark (NHL). A National Historic Landmark is a place that possesses exceptional value or quality in illustrating or interpreting the heritage of the United States. The Kaneohe Naval Air Station NHL commemorates the December 7, 1941 Japanese attack on Oʻahu. The NHL includes Facilities 1 through 5 (seaplane ramps), Facility 101 (Hangar 1), and the seaplane parking areas to the east of Hangar 1 and along Kāneʻohe Bay.

The Naval Air Station Kaneohe Bay Aviation District, eligible for listing in the NRHP, is a proposed historic district located within the Aviation District. This eligible historic district includes 55 buildings and structures and the historic portion of the present runway. It encompasses the NHL described above, in addition to Hangars 102, 103, 104, and 105 to the west of Hangar 101 (that, together, make up Hangar Row); the runway; an administrative building; a utilities shop; a torpedo workshop; and a bombsight workshop. The runway and buildings in this area have generally remained the same since the end of WWII. No large facilities have been demolished in this area, and no major facilities have been constructed since the end of the war. Although the runway has been extended and widened post-WWII, the district incorporates only the original portion of the runway.

Treatment of the district and facilities must follow regulations and processes per *Marine Corps Order P5090.2A* and *Sections 106* and *110* of the *National Historic Preservation Act of 1966, as Amended*.

Aviation District Area Development Plan

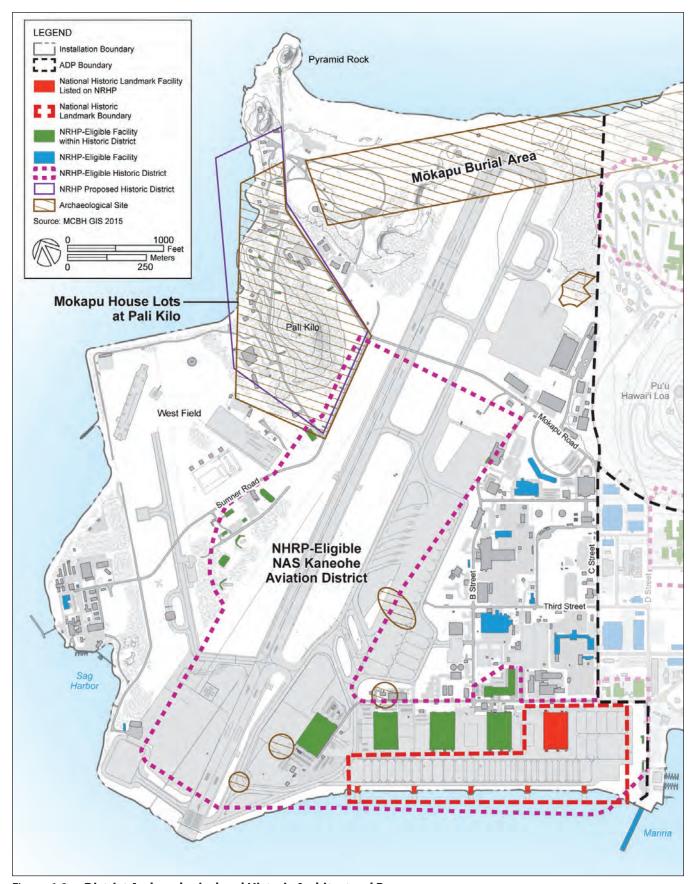


Figure 6-9 **District Archaeological and Historic Architectural Resources**

6.3.6 Safety Hazards

Safety hazards related to military operations in the Aviation District are shown on Figure 6-10 and briefly described below.

Explosive Safety Quantity Distance Arcs



Air Installation Compatibility Use Zones

The AICUZ program addresses land use compatibility for airfields by establishing runway primary surfaces, transitional zones, clear zones, accident potential zones, and noise exposure impacts. Day-night average sound level (DNL) noise zone land use compatibility guidelines are shown in Table 6-1.

Table 6-1 **DNL Noise Zone Land Use Compatibility**

GENERAL LAND USE	DNL Noise Zone			
	65-69 dB	70-74 dB	75-79 dB	80+ dB
Residential	No ¹	No^1	No	No
Industrial	Yes	Yes²	Yes²	Yes ²
Commercial	Yes	Yes ²	Yes²	No
Public/Semi-Public Services	Yes ²	Yes²	Yes ²	No
Recreational	Yes	Yes²	Yes²	No
Open Space/Low Density	Yes	Yes	Yes	Yes
Transportation (no structures)	Yes	Yes	Yes	Yes

¹Unless sound attenuation materials are installed.

Compass Calibration Pad

To maintain accurate instrumentation of aircraft compasses, this facility requires that no ferrous metals be placed within 500 ft of the calibration pad.

²Measures to achieve noise level reduction need to be incorporated into the construction of the portions of these buildings where there are public facilities, office areas, or noise-sensitive areas.

Source: Department of Defense Instruction 4165.57. Air Installation Compatible Use Zones, 1977.

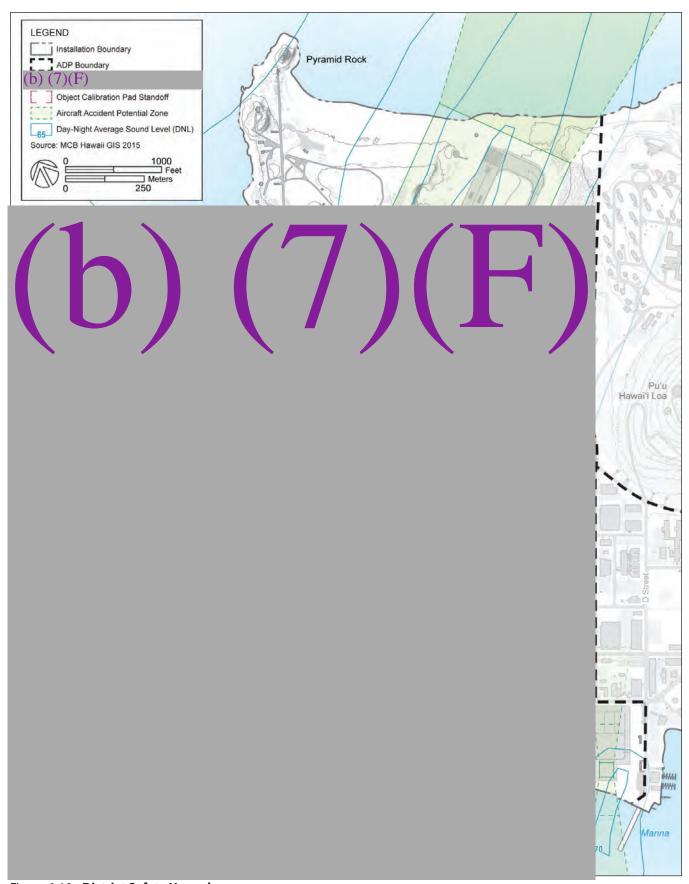


Figure 6-10 **District Safety Hazards**

6.3.7 AT/FP and Physical Security

Antiterrorism/force protection (AT/FP) measures are intended to protect personnel, infrastructure, and critical resources from attack. The AT/FP guidance mandates that measures are taken in both site and building design, which can have an appreciable impact on site planning and building design, as well as on construction cost. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-01*, *Installation Master Planning* (May 2012). Figure 6-11 shows lands in the Aviation District encumbered by the standoff distances for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries. The waters immediately surrounding the Aviation District are used by Marines for various activities, including helicopter search and rescue training and amphibious landing training. Access within a 500-yard buffer surrounding the installation is restricted due to its designation as a Naval Defense Sea Area.



6.3.8 Sources of Air, Noise, and Light Pollution

Air Pollution

There are no heavy industrial operations at MCB Hawaii which emit high levels of air pollutants. However, there have been concerns expressed by residents in surrounding civilian communities about the impacts of aircraft engine exhaust. The Marine Corps Public Affairs Office responded to community comments made during a community meeting by noting that during Kona wind conditions, when wind blows from the south and west, aircraft engine exhaust fumes should be carried to sea, away from Windward Oʻahu communities. During normal northeast tradewind conditions, winds do blow toward Windward communities. However, MCB Hawaii meets all State of Hawaiʻi DOH requirements for air emissions, and is inspected annually by the DOH Clean Air Branch. There have been no negative findings by the DOH Clean Air Branch during inspections. MCB Hawaii conducts semi-annual monitoring and reporting to the DOH as part of an environmental compliance program.

Noise Pollution

Ongoing aircraft operations are the major source of noise impacting not only the Aviation District but also all of MCB Hawaii Kaneohe Bay and surrounding civilian communities. The most recent noise study prepared as part of the DoD's AICUZ program was completed in 2009. For land use planning purposes, noise exposure levels were divided into three noise zones based on DNL or day-night equivalent sound levels contours. The DNL is an average sound level generated by all aviation-related operations during an average day or busy day for a 24-hour period, with sound levels of night time noise events emphasized by adding

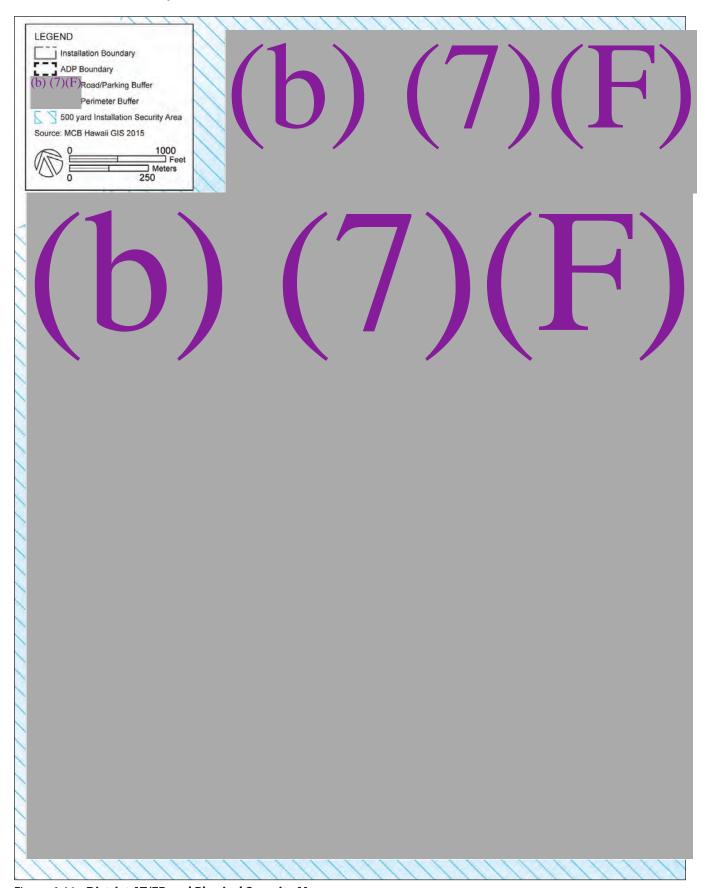


Figure 6-11 District AT/FP and Physical Security Map

a 10 decibel (dB) weighting. Night time is defined as the period from 2200 to 0700 hours. DNL noise contours and zones are shown on Figure 6-10, and corresponding appropriate land uses are listed in Table 6-1.

Light Pollution

There are no major sources of light pollution at MCB Hawaii Kaneohe Bay. Night time light sources associated with urbanization are an ongoing concern for migratory seabirds.

6.4 Alternative Site Development and Evaluation

Alternative site development plans were developed through a multi-step process involving key installation stakeholders, including representatives from MCB Hawaii departments, operational commands, and other supporting elements. A four-day charrette allowed participants to develop a variety of possible planning actions to address identified facility and land use issues in the Aviation District. These concepts were revised and presented as alternatives to stakeholders at a three-day concept workshop for evaluation. Additional guidance and direction was also provided for further plan refinement. The alternatives considered different options for the following.

- Aviation unit headquarters
- · District parking structures
- Reuse of Base Motor Transport site
- Demolition of Hangar 105 and taxiway realignment
- MCCS self-storage facility locations

The Charrette Summary Report (IMP Appendix A) and Concept Workshop Report (IMP Appendix B) thoroughly document the attendees, planning concepts, plan alternatives, and evaluation of the alternatives during the plan development process. Subsequent to the concept workshop, a preferred alternative for the Aviation District was presented to MCB Hawaii leadership. Leadership's final guidance is reflected in the final ADP presented in Section 6.5.

6.5 Area Development Plan

This section presents the ADP for the Aviation District at MCB Hawaii Kaneohe Bay. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific district-level goals and objectives. The future development envisioned for the Aviation District is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.5.1 Illustrative Plan

The Illustrative Plan graphically portrays, planned, programmed, and recommended future development that supports the overarching planning goals for MCB Hawaii Kaneohe Bay. Figures 6-12 and 6-13 represent an optimized aviation support area with increased parking, land reservation for future mission growth, improved airfield security, expanded pedestrian and bicycle networks, and redeveloped community support facilities. Important plan features culminating from the IMP planning process include the following.

Building 6468 Reuse

Reuse Building 6468 for MAG-24 and MWSD Headquarters. When CPRW-2 departs MCAS Kaneohe Bay in April 2017, the unit vacates approximately 90 percent of their Headquarters (Building 6468), which was constructed in 1999. MAG-24 Headquarters, currently located in Building 301, will relocate into this space. Remaining administrative space can support MWSD administrative expansion in the future as required.

Building 301 Renovation

Renovate Building 301 for MALS-24 Headquarters. Building 301 is a historic structure located within the proposed historic Naval Air Station Kaneohe Bay Aviation District. The renovation and restoration of this facility into a modern and efficient administrative building allows for MALS-24 Headquarters to vacate Hangar 103. Based on unit requirements, approximately half of Building 301 can be designed as an indoor physical fitness center to support MAG-24 personnel.

Aircraft Hangar Redevelopment

Demolish Hangar 105 after the scheduled departure of Navy P-3 Squadron VPU-2 and VR-51 is relocated to another hangar. As a long-term development opportunity, redevelop Hangars 102, 103, and 104 into a consolidated aircraft hangar and expand aircraft apron. Hangar redevelopment size, siting, and configuration will be refined in future development plans.

Airfield Security



MCB Hawaii Motor Transport Relocation

Relocate MCB Hawaii motor transport facilities to a portion of the salvage yard in the Base Support District. The primary facilities of the existing compound were constructed between 1941 and 1945, are in poor condition, and require replacement. Rebuilding a new facility outside the Aviation District supports the long-range land use planning that prioritizes aviation mission support in this district.

District Parking Structures

Construct district parking structures to address the existing parking deficiency in the southern portion of the district, and (b) (7)(F)

(b) (7)(F)

location north of Hangar 103 provides a central location in proximity to aviation facilities located along First and B Streets and can replace stalls lost to AT/FP requirements when Building 301 is renovated. A 4-story, 396-stall structure located at the corner of First Street and C Street provides additional parking in the district outside of where entry control points are typically established to fully secure the airfield when required.

Buildings 1359 and 1360 Reuse

(b) (7)(F)

(b) (7)(F)

outside the runway primary surface. Existing building occupants, the Base Environmental Department, will relocate to available administrative office space in the Base Support District. Site improvements to meet EOD unit requirements include a vault to securely store operations and training manuals, a ready storage locker, a tool training pit, security fencing and lighting, and a garage for the total containment vessel and operations response trailer.

MWSD Organizational Parking Area

Develop a 2-ac MWSD organizational parking area to support an increase in heavy equipment and vehicles. (b) (7)(F)

MCCS Self Storage Replacement Facility

Construct a MCCS self-storage replacement facility at West Field on a site east of Waterfront Operations. The previous facility was demolished by MV-22 hangar construction (P-904). This site replaces the pervious Pali Kilo site which had not accounted for the topographic relief of the site.

The Cabanas Redevelopment

Redevelop The Cabanas temporary lodging facility at West Field with additional rooms and an overflow parking lot.

Pedestrian and Bicycle Networks

Expand pedestrian and bicycle networks. Add sidewalks to proposed facilities and along B and C Streets to provide safe pedestrian access through the aviation mission support area along a north/south axis. Construct a multiuse path along First Street with bicycle shelters in front of Hangars 102 and 104.

Pyramid Rock Beach Amenities

Improve Pyramid Rock beach amenities, including a formal entrance, graded and expanded permeable parking lot, additional picnic pavilions, beach access boardwalks to protect the dunes, and sand volleyball courts.

Mokapu Road Realignment



Land Reservation

The Aviation District ADP identifies 12.6 ac of land to support future airfield-related mission support, industrial, and training infill development throughout the district.

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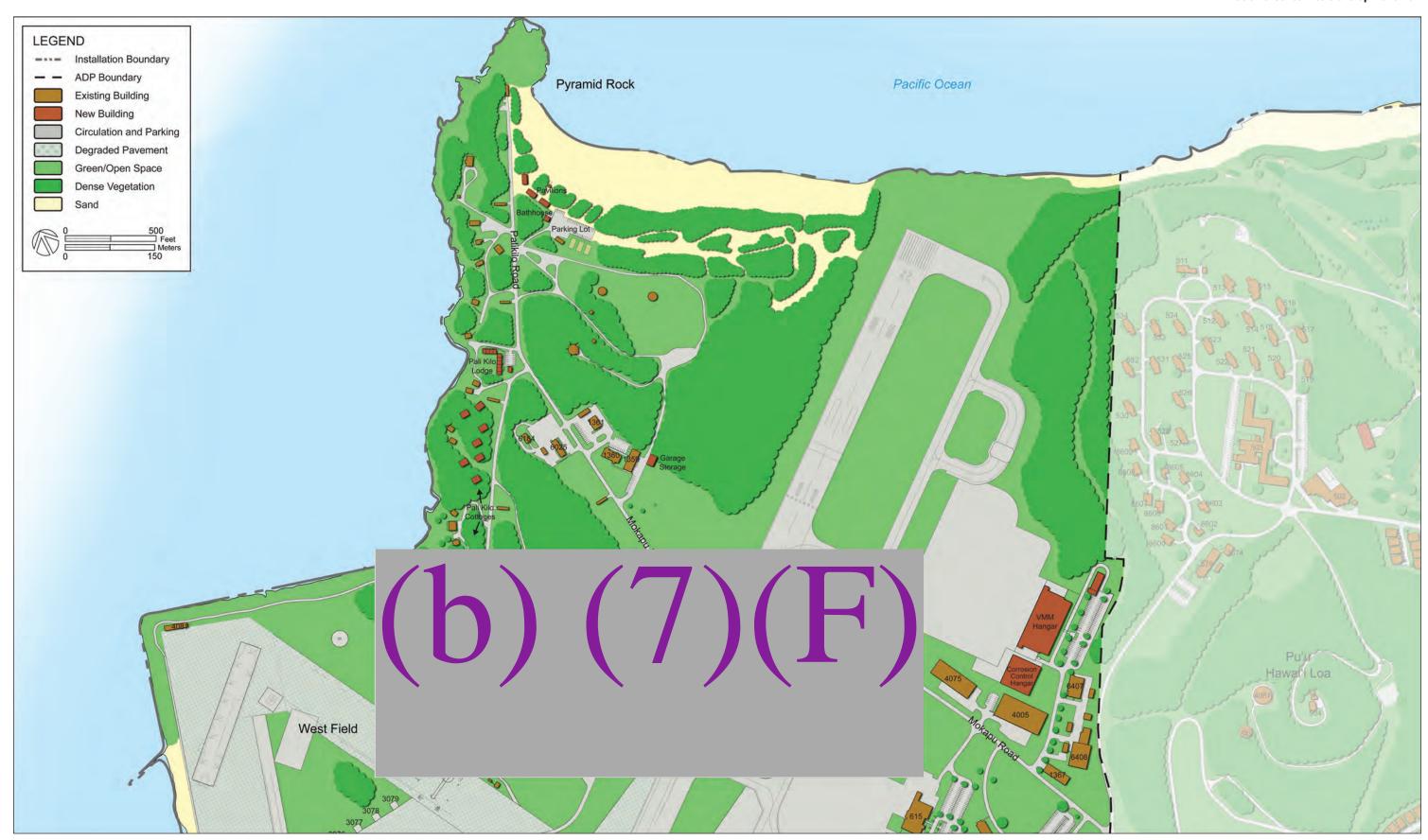


Figure 6-12 Aviation District Illustrative Plan (North)

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Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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Section 6 | ADP Area Analysis FOR OFFICIAL USE ONLY

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Figure 6-13 Aviation District Illustrative Plan (South)

Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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Section 6 | ADP Area Analysis

6.5.2 Regulating Plan

The Regulating Plan provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum and maximum building heights (number of stories) to appropriately increase development density at MCB Hawaii Kaneohe Bay. The building height guidelines intend to maximize the development potential of the Installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for the Aviation District, Figures 6-14 and 6-15, continues the existing mission, industrial, and recreational uses and identifies appropriate design characteristics and uses for infill development areas. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01, Installation Master Planning* (May 2012) and include the following:

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- · Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers
- Medical Building Types (medical centers and clinics)
- Commercial/Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, a bowling alley, and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.5.3 Circulation and Parking Plan

The overall goal of the Aviation District Circulation and Parking Plan, Figures 6-16 and 6-17, is to improve vehicular flow and pedestrian safety, reduce the amount of surface parking while providing the required number of stalls, and increase walkability and bicycle riding throughout the district. Development of a central parking structure along First Street increases airfield security by removing POV parking from the apron. A multipurpose pathway south of First Street connects via Third Street to G Street and provides direct pedestrian and bike access to the southern portion of the district from the center of the installation. Bike shelters are proposed along the path in front of Hangars 102 and 104. Sidewalks are proposed along B and C Streets to improve pedestrian safety and mobility throughout the district along a north–south axis. The Mokapu Road underpass would improve flight line security and alleviate the current road closures.

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Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**



Figure 6-14 Aviation District Regulating Plan (North)

Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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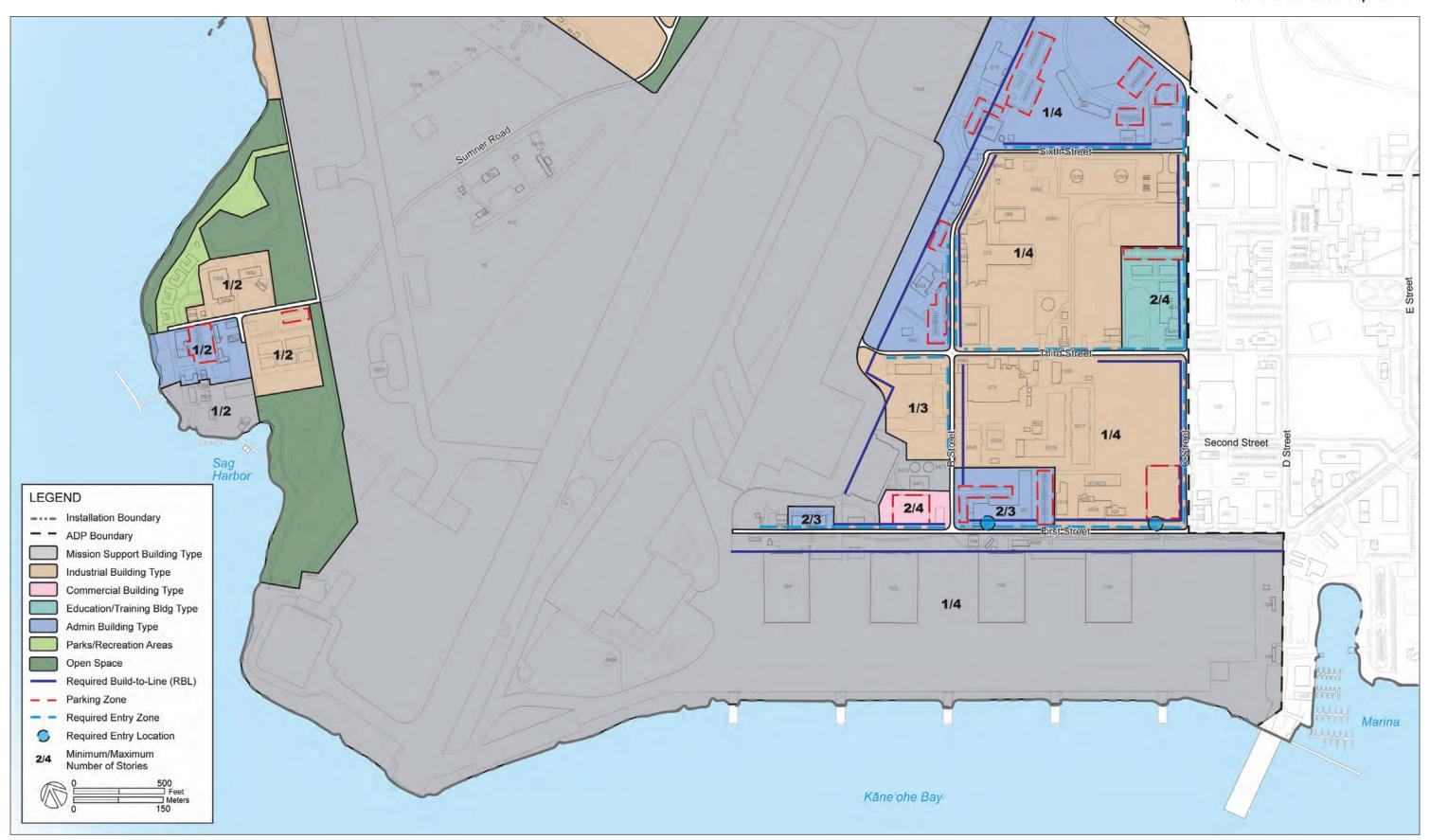


Figure 6-15 Aviation District Regulating Plan (South)

Marine Corps Base Hawaii Installation Master Plan Aviation District Area Development Plan

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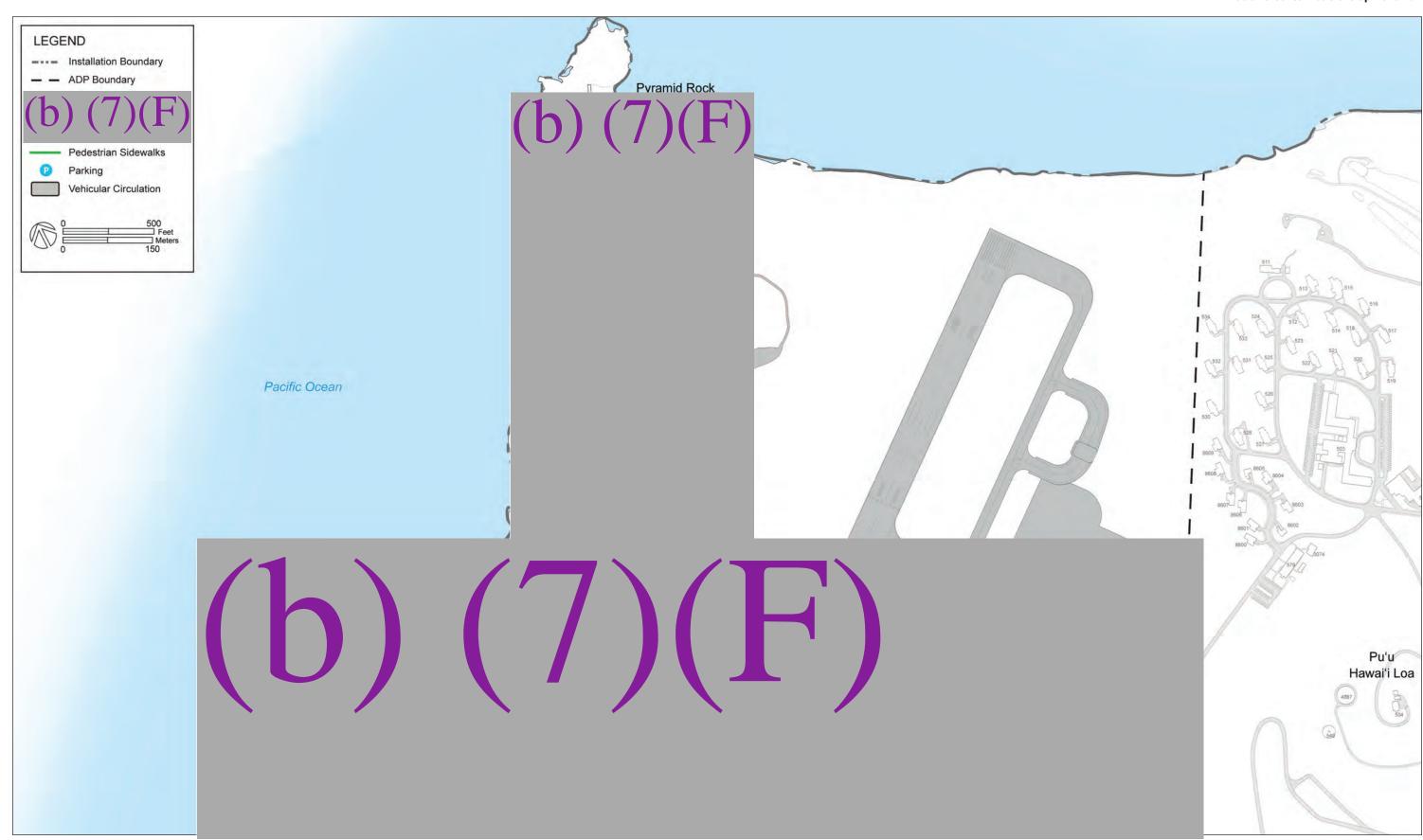


Figure 6-16 Aviation District Circulation and Parking Plan (North)

Marine Corps Base Hawaii Installation Master Plan Aviation District Area Development Plan

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Figure 6-17 **Aviation District Circulation and Parking Plan (South)**

Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Aviation District ADP* presented in the context of the installation's existing CIP. The plan is presented graphically on Figure 7-1 and detailed in Table 7-1, which describes each planning action, including any required demolition or other dependent actions.

The timeframe of each planning action is classified as short-term, midterm, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions consist primarily of existing projects developed as part of the installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D. Modifications to the scope of existing projects are noted and list an updated ROM cost where appropriate.

Table 7-1 Summary of Proposed Development Actions (Map ID 1–6)

Map ID	Time Frame	MCB Hawaii Project #	Project Title and Description	ROM Cost (\$K)
1	Short-term FY13 CCD 3/16	P-904	MV-22 Hangar and Infrastructure	(b) (5)
2	Short-term FY13 CCD 3/16	P-905	MV-22 Aircraft Staging Area	
3	Short-term FY14 CCD 2/17	P-907/908	MV-22 Hangar • Hangar for 2nd Squadron • Aircraft Parking Apron and Infrastructure • Demolish B1278 and B1279	
4	Short-term FY14 CCD 12/16	P-884	Aviation Simulator Modernization/Addition - Supports training for existing and planned squadrons base at MCB Hawaii - Demolish and Relocate B6182 and B6510 - Baseball fields relocated to Community Support District	
5	Short-term FY14 CCD 9/15	P-864	MALS-24 Aircraft Maintenance Expansion Construct new composite shop Construct new ground support equipment holding shed	
6	Short-term FY14 EAD 3/16	P-863	HMLA Hangar Renovation Renovate HMLA administrative and shop spaces in Hangar 101	

Table 7-1 **Summary of Proposed Development Actions** (Map ID 7–17)

Map ID	Time Frame	MCB Hawaii Project #	Project Title and Description	ROM Cost (\$K)
7	Short-term FY15 CCD 8/18	P-861	(b) (7)(F)	(b) (5)
8	Short-term FY15 EAD 9/15	P-924	MV-22 EIS Traffic Improvements Install right turn lane at Mokapu Road and Reed Road intersection	
9	Short-term FY16	P-116	P-8A Detachment Support Facilities • Modify Hangar 104 and B6470 • Enlarge and realign aircraft rinse facility	
10	Short-term FY16	P-902	Airfield Lighting Improvements Replace and modernize various lighting system components New standby generator and lighting vault Demo B138 and B1674	
11	Short-term FY18	P-887	 LHD Pad Conversion and MV-22 Landing Zones (LZ) Convert LHA pad to LHD pad at MCAS Construct MV-22 LZ at MCAS Construct 4 MV-22 LZ at MCTAB 	
12	Short-term	Proposed	MAG-24 Headquarters Relocate to B6468 (Finn Building) CPRW-2 Decommissioned April 2017	
13	Short-term	P-915 Modified	MCCS Self-Storage Facility • Construct 438 new self-storage units • Based on "full build" option from PVA study • New location from Pali Kilo Road site	
14	Short-term	P-946	Corrosion Control Hangar Construct new strip/paint hangar (COA 3) Support Integrated Maintenance Plan events for of H-1, MV-22, and H-60 aircraft Construct three-story 396-stall parking structure at corner of First Street and C Street Demolish B5096 and B1631	
15	Short-term	P-936	Van Pad Modernization and Support Equipment Storage • Provides 400-Hz power, new communications infrastructure, and grounding system • Replace 8,000-sf MMF support equipment storage facility • (b) (7)(F) restrooms, and additional POV parking	
16	Mid-term	P-913	(b) (7)(F)	
17	Mid-term	Proposed	 MALS-24 Headquarters Renovate B301 for admin, classrooms, and indoor fitness room Construct 2-story, 200-stall parking structure to replace stalls lost to B301 AT/FP measures and from securing apron by maintenance hangars Multiuse path and bike shelters along First Street 	

Table 7-1 **Summary of Proposed Development Actions** (Map ID 18–28)

Table 7	- Julilliar y C	Troposed Development Actions (Wap 10 10 20)				
Map ID	Time Frame	MCB Hawaii Project #	Project Title and Description	ROM Cost (\$K)		
18	Mid-term	P-876	(b) (7)(F)	(b) (5)		
19	Mid-term	P-882 Modified	(b) (7)(F)			
20	Mid-term	P-891	Hangar 102 CH-53K Upgrades			
21	Mid-term	Proposed	Demolish Hangar 105 • Relocate VPU-2 and VR-51			
22	Mid-term	P-926	MALS-24 Armament Shop and Storage Construct 11,300 permanent dehumidified structure for MALS support equipment Renovate B1304	(b) (5)		
23	Mid-term	Proposed	Pali Kilo Cottage Expansion Construct 12 additional cottages New 10-room lodge Demolish B1180, reconstruct in Base Support District			
24	Long-term	Proposed	Pyramid Beach Improvements Formal entry with improved permeable parking lot New picnic pavilions Restroom and shower facility Dune boardwalks Sand volleyball courts			
25	Long-term	Proposed	Hangar 102, 103, and 104 Redevelopment Redevelop hangars into consolidated maintenance hangar Expand aircraft apron			
26	Long-term	Proposed	MWSD Organizational Parking Construct 2-ac organizational parking lot (b) (7)(F)			
27	Long-term	Proposed	The Cabanas Redevelopment Redevelop MCCS temporary lodging facility onsite Four buildings/40 rooms with 8-ft base flood elevation 100-ft shoreline setback 28-stall overflow parking lot Demolish existing structures			
28	Long-term	P-883	Access Road and Runway Underpass			
29	Long-term	Proposed	(b) (7)(F)			



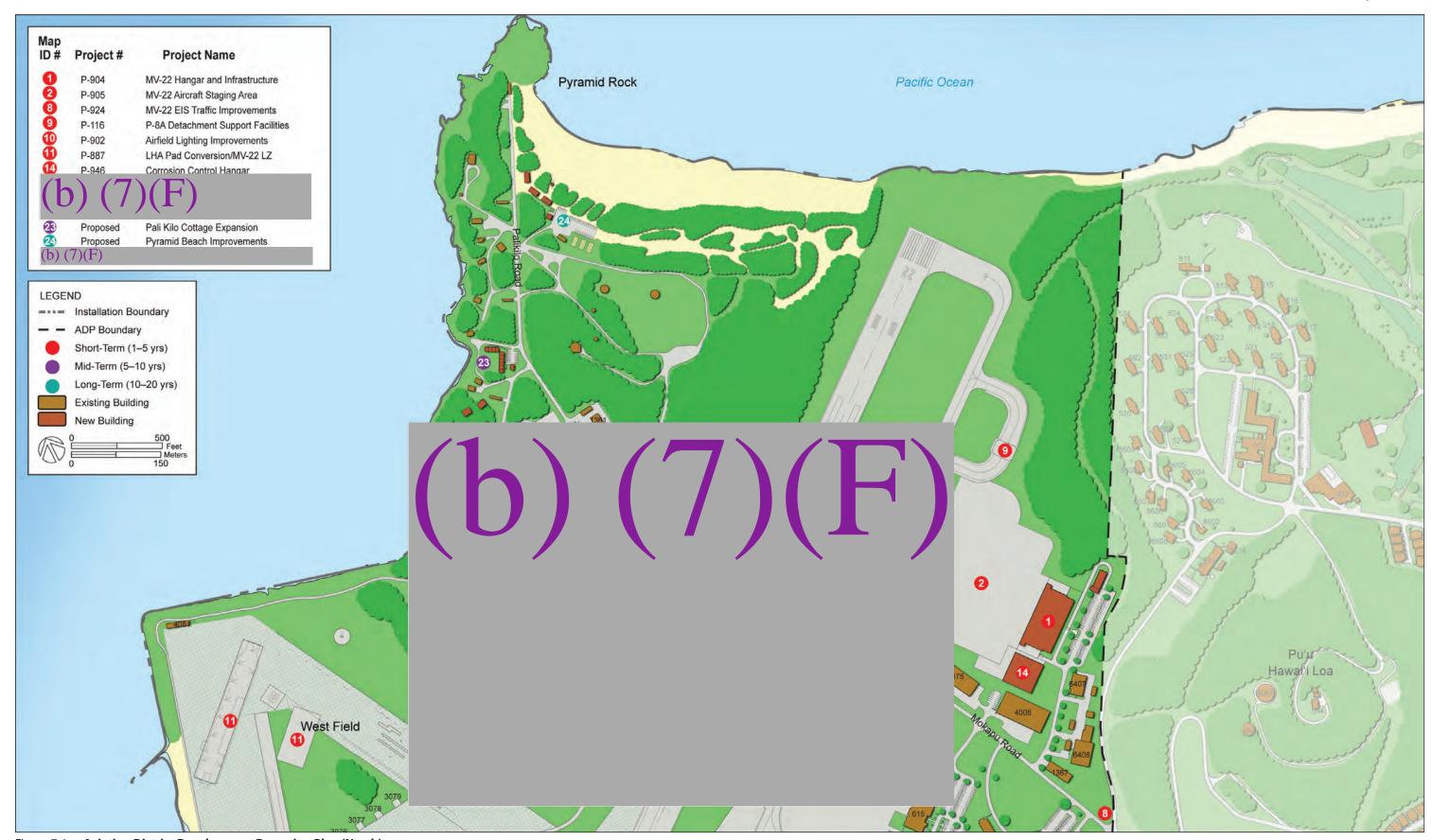


Figure 7-1 Aviation District Development Execution Plan (North)

Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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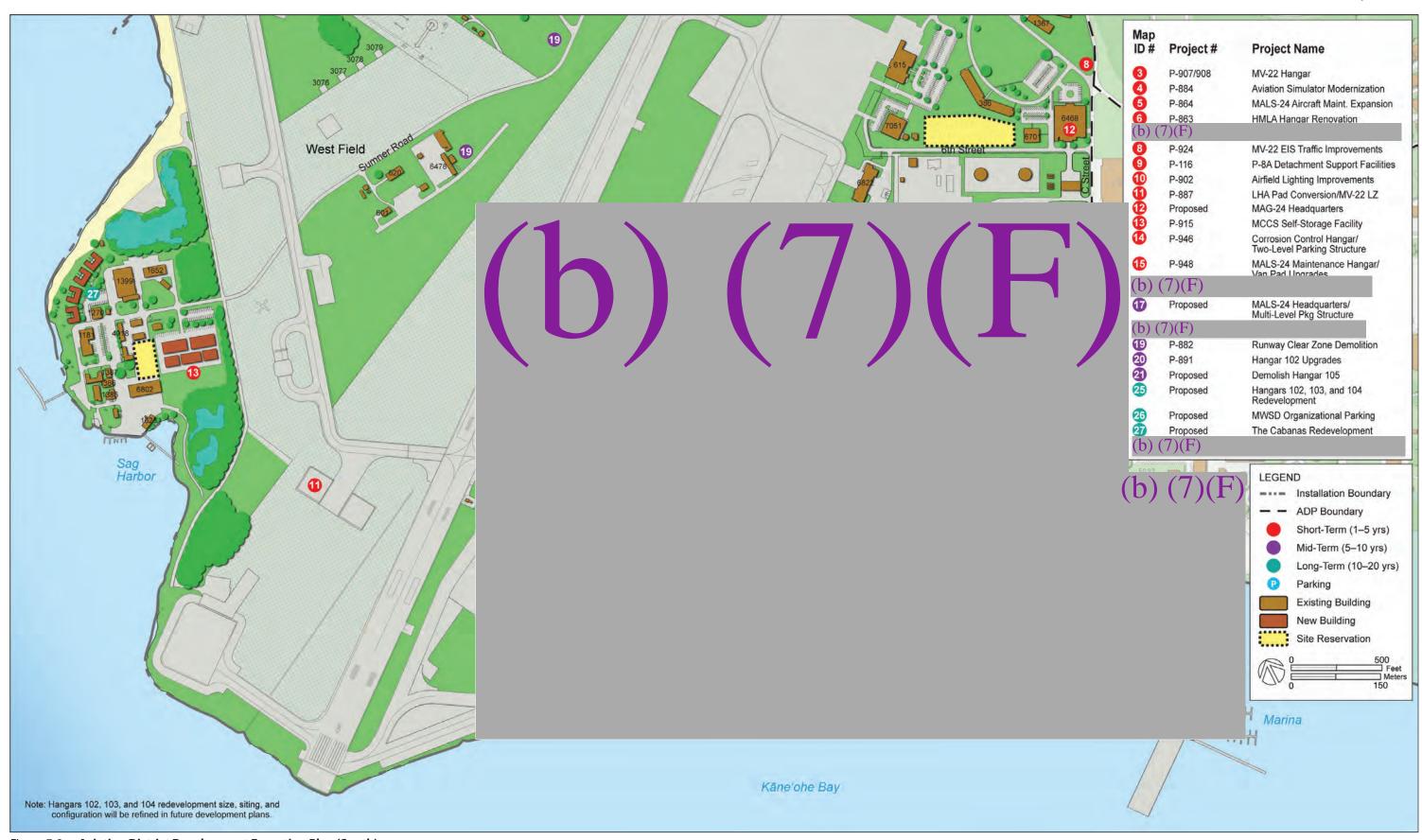


Figure 7-2 Aviation District Development Execution Plan (South)

Marine Corps Base Hawaii Installation Master Plan **Aviation District Area Development Plan**

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7.2 Demolition Plan

Figure 7-3 highlights facilities proposed for demolition in the Aviation District. These facilities have either exceeded their economic life, are located within the primary surface of the runway, or need to be relocated to support other development actions. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition** (Facilities 138–1651)

FACILITY NUMBER	FACILITY NUMBER FACILITY USE		FACILITY AGE	YEAR BUILT
138	Airfield Light Storage	884	73	1943
105	Maintenance Hangar*	117,226	73	1943
300	Wrecker Section	60	71	1945
322	Grease Rack	875	64	1952
351	Auto Vehicle Shop*	6,250	75	1941
352	Office/Transportation Pool*	2,200	74	1942
374	MARFORPAC Band*	33,352	73	1943
377	Automotive Repair Garage*	8,592	71	1945
385	General Warehouse/Auto Parts*	2,889	32	1984
399	Auto Vehicle Shop*	10,478	71	1945
<u>(b)</u>	(/)(F)	252	52	1062
1236	Wrecker Section	252	53	1963
1278	Warehouse	3,944	51	1965
1279	Warehouse	3,939	51	1965
1368	MCCS The Cabanas	1,680	45	1971
1369	MCCS The Cabanas	960	45	1971
1370	MCCS The Cabanas	960	45	1971
1371	MCCS The Cabanas	960	45	1971
1374	G-3 Exercise Support Bldg.	960	45	1971
1375	G-3 Exercise Support Bldg.	993	45	1971
1394	MCCS The Cabanas	1,960	44	1972
1395	MCCS The Cabanas	2,400	44	1972
1397	CPRW-2 TSC	2,820	44	1972
(b) (7)	(F)			
1621	MCCS The Cabanas	2,400	37	1979
1624	MCCS The Cabanas	980	38	1978
1631	Warehouse/Washrack*	1,145	41	1975
1651	MCCS The Cabanas	960	41	1975

^{*} Denotes a facility encumbered by an existing NAVFAC Energy Savings Performance Contract (ESPC). ESPC contract encumbrance continues until September 2030. Contract termination costs should be considered during project programming.

Table 7-2 **Summary of Proposed Demolition** (Facilities 1674–6776C3)

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FACILITY NUMBER	FACILITY USE	AREA (SF)	FACILITY AGE	YEAR BUILT	
1674	Storage Facility	260	40	1976	
(b) (7)((F)				
4051	Auto Maintenance Shop	1,485	31	1985	
4064	Tanker Hose Shed	25	32	1984	
5069	Corrosion Control Hangar*	13,284	26	1990	
6040	Equipment Load Test Pad	2,000	26	1990	
6128	GME Vehicle Maintenance Shed	336	13	2003	
(b) (7)(F))				
6510	POL Ops/Sampling/Testing Bldg.*	900	13	2003	
6514	Shelter Baseball Dugout	156	13	2003	
6515	Shelter Baseball Dugout	156	13	2003	
6516	Field Storage	84	17	1999	
6518	Shelter Baseball Dugout	156	13	2003	
6519	Shelter Baseball Dugout	156	13	2003	
6520	Field Storage	84	17	1999	
6521	Press Booth	152			
(b) (7)(F	<u> </u>				

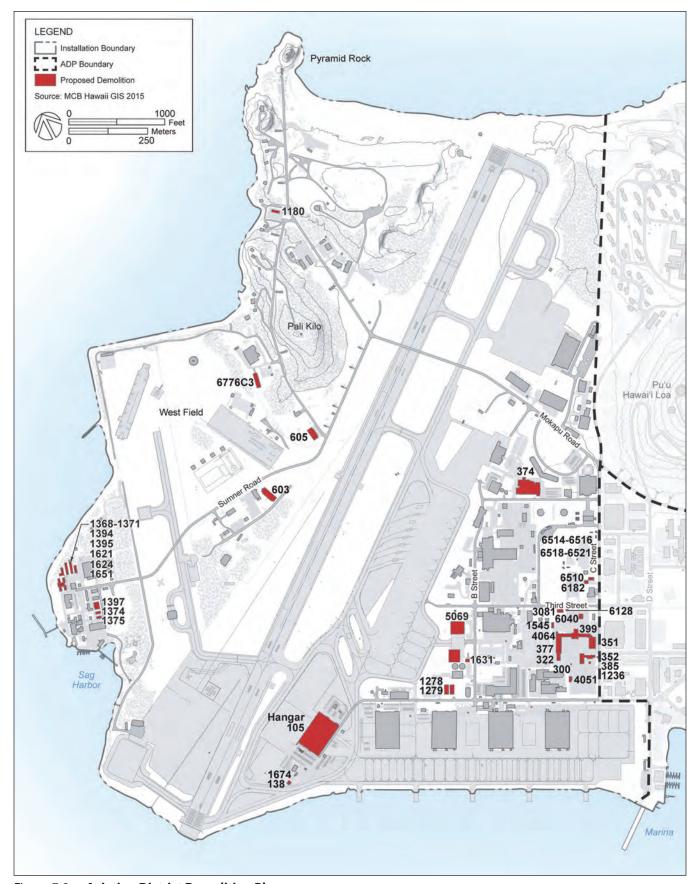


Figure 7-3 **Aviation District Demolition Plan**

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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	FY	Fiscal Year
AC	Acre	GIS	Geographic Information System
ADP	Area Development Plan	HECO	Hawaiian Electric Company
AT/FP	Antiterrorism/Force Protection	HMLA	Marine Light Attack Helicopter
BEQ	Bachelor Enlisted Quarters		Squadron
BFR	Basic Facility Requirement	HSM	Helicopter Maritime Strike Squadron
BN	Battalion	HQ	Headquarters
BWS	Board of Water Supply	HQBN	Headquarters Battalion
CCD	Construction Completion Date	ICRMP	Integrated Cultural Resources
CCN	Category Code Number	IMP	Installation Master Plan
CDET	College of Distance Education and Training	INRMP	Integrated Natural Resources Management Plan
CIP	Capital Improvement Plan	IPAC	Installation Personnel Administration Center
CISD	Communications Information Systems Directorate	IRP	Installation Restoration Program
CLB	Combat Logistics Battalion	kV	Kilovolt
CPRW	Commander, Patrol and	LOGCOM	Marine Corps Logistics Command
	Reconnaissance Wing	MAG	Marine Aircraft Group
DEERS	Defense Enrollment Eligibility	MAGTF	Marine Air Ground Task Force
	Reporting System	MARFORPAC	U.S. Marine Corps Forces Pacific
DoD	Department of Defense	MCAS	Marine Corps Air Station
DOH	Department of Health	MCB Hawaii	Marine Corps Base Hawaii
EA	Each	MCCS	Marine Corps Community Services
EA	Environmental Assessment	MCO	Marine Corps Order
EAD	Estimated Award Date	MCTAB	Marine Corps Training Area Bellows
ECP	Entry Control Point	MILCON	Military Construction
EIS	Environmental Impact Statement	MITSC	MAGTF Information Technology
EMS	Emergency Medical Service		Support Center
EOC	Emergency Operation Center	MSL	Mean Sea Level
ESPC	Energy Savings Performance Contract	MVA	Megavolt Ampere
ESQD	Explosive Safety Quantity Distance	NAVFAC PAC	Naval Facilities Engineering
FT	Feet		Command Pacific

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Wildlife Management Area

Water Reclamation Facility

Wounded Warrior Battalion

Wastewater Treatment Plant

NCIS Naval Criminal Investigation Service

NHL National Historic Landmark

NRHP National Register of Historic Places

O&T Operations and Training

PCA Pearl City Annex

PMO Provost Marshal's Office

PN Personnel

POV Privately-Owned Vehicle

PPV Public-Private Venture

PSI Pounds per Square Inch

PV Photovoltaic

PVA Project Validation Assessment

RTF Range Training Facility

ROM Rough Order of Magnitude

SACC Substance Abuse Counseling Center

SACO Substance Abuse Control Officer

SAIA Sikes Act Improvements Amendments

SCADA Supervisory Control and

Data Acquisition

SF Square Feet

SOCPAC Special Operations Command Pacific

SOI School of Infantry

SY Square Yards

TECOM Marine Corps Training

and Education Command

TSF Training Support Facility

UDP Unit Deployment Program

UFC Unified Facilities Criteria

UM Unit of Measure

USPACOM U.S. Pacific Command

VIP Very Important Person
VR Navy Reserve Squadron

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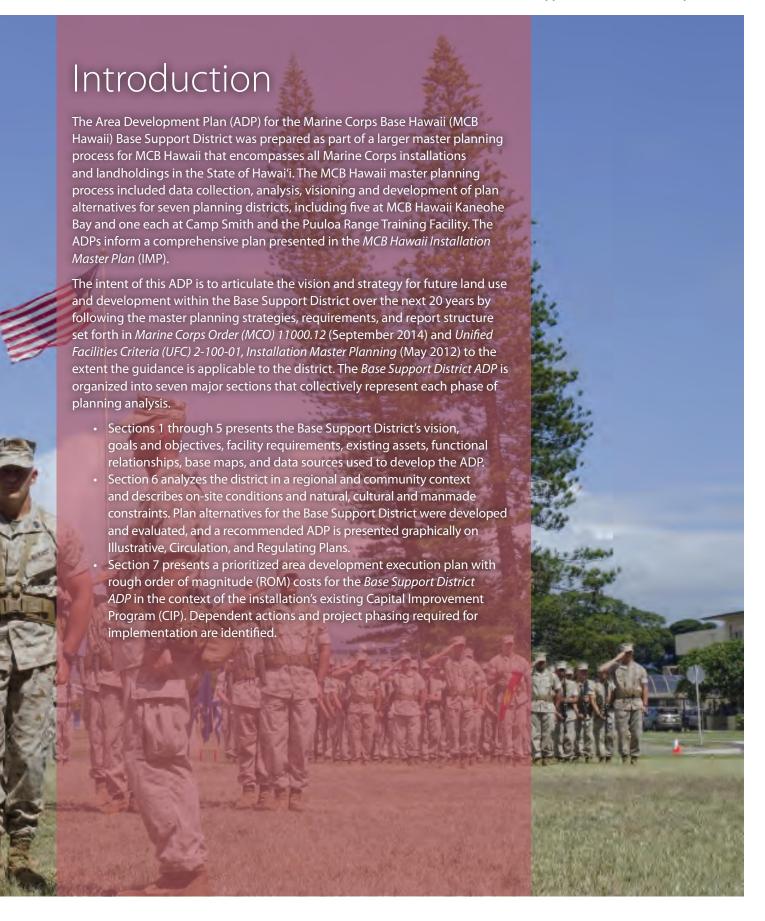
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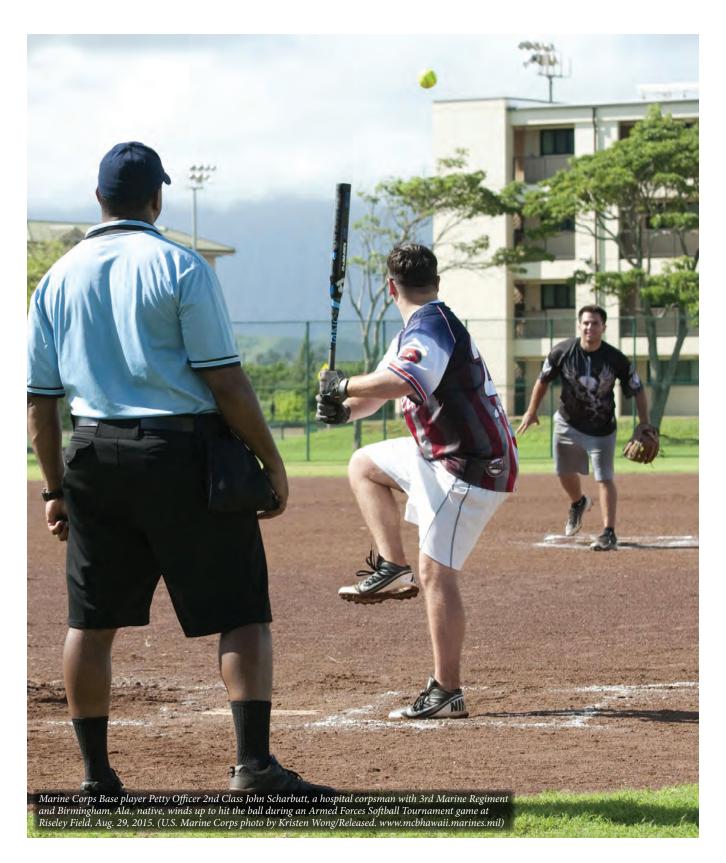
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1 Vision, Goals, and Objectives

1.1 Background

The Base Support District is located at MCB Hawaii Kaneohe Bay in the central portion of Mōkapu Peninsula, as shown on Figure 1-1. The district is bounded by C Street on the west, Mokapu Road on the north, the Mokapu Central Drainage Channel on the east, and Kāne'ohe Bay on the south. The majority of facilities and activities in this district are associated with administration, public works, and community support. Some of the major uses include headquarters buildings, public works (e.g., wastewater treatment plant, main substation, recycling), Provost Marshal Office (PMO), base supply, professional education, active duty and transient billeting, and Marine Corps Community Service (MCCS) support (e.g., Marine and family services, playing fields, and the marina).

The Base Support District shares the installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.2 Base Support District

The Base Support District has its own vision, goals, and objectives that take into consideration the District's unique mission, functions, location, and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable. The planning goals and objectives were developed during the visioning workshop and subsequently refined at the planning charrette and concept workshop.

District Mission

To provide facilities, maintenance, quality of life and administrative services to support marines, sailors, their families, and civilians

District Vision

To create a walkable community with multistory and energyefficient facilities and a network of greenspaces, while preserving the district's historic fabric

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Section 1 | Vision Plan

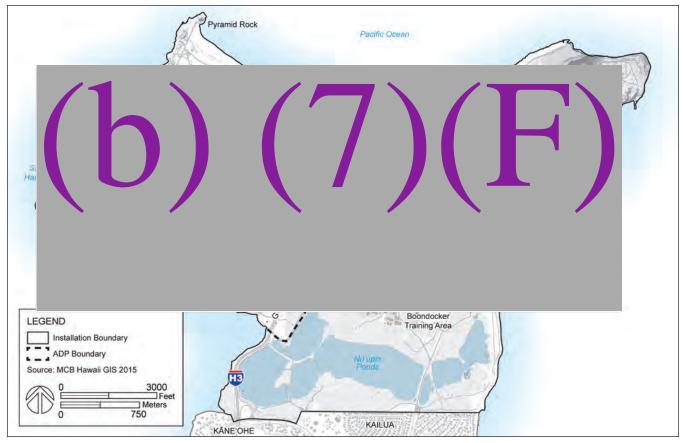


Figure 1-1 **District Location**

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The planning goals of the Base Support District include the following.

- Reuse existing facilities: Consolidate administrative functions from across the installation, as appropriate, into modern and historic buildings to support broader land use planning goals.
- Replace aging infrastructure: Many of the buildings in the district were
 constructed in the 1940s and are deteriorating, inefficient, and should be
 recapitalized. Non-historic and underutilized facilities should be vacated
 and demolished to reduce ongoing maintenance costs and provide space
 for future development, as appropriate.
- Improve vehicular and pedestrian network connections: Modify the road infrastructure to alleviate key traffic concerns while improving antiterrorism/force protection (AT/FP) measures. Provide pedestrian and bikeway connections to networks outside the district.
- Increase development density: The Base Support District is centrally located with direct access to other areas of the base. Planning should ensure that redevelopment maximizes these prime lands by increasing development density to ensure the highest and best land use over the long-term. Activities that support the greater community should be provided areas in close proximity to major billeting and family housing areas over the long-term.
- Enhance community support facilities: The district includes unique recreational activities (boating, bowling, a fitness center, playing fields and courts, and a skate park), but some facilities and infrastructure are inadequate to meet the demand.

Specific planning objectives of the *Base Support District ADP* include the following.

- Reuse Buildings 212 and 3089 to support functional consolidation
- Expand an indoor fitness center facility onsite
- · Redevelop aging warehouses with modern and efficient facilities
- Redevelop the Motor Transportation Complex at the Salvage Yard
- Redevelop the PMO Complex with a parking structure
- · Redevelop the Recycling Center
- (b) (7)(F)
- · Provide sidewalks and multiuse paths
- Expand private boat storage at the marina
- · Redevelop the Enlisted Club site
- Upgrade fuel pier to support High-Speed Vessel roll-on/roll-off operations
- Identify space for redevelopment and operational expansion

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2 Facility Requirements and Land

This section establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Base Support District ADP* is based.

2.1 Area Force Loading

2.1.1 MCB Hawaii Kaneohe Bay

Estimated personnel loading data for FY18 indicates that MCB Hawaii Kaneohe Bay will have a total population of just over 18,000 (as shown in Table 2-1), including the arrival of two MV-22B squadrons, the departure of three Navy P-3 squadrons, and the arrival of a rotational Navy P-8 detachment. This population is spread throughout the base districts.

Table 2-1 Projected FY18 Force Loading for MCB Hawaii Kaneohe Bay

OFFICER ¹	ENLISTED ¹	CIVILIAN¹	DEPENDENT ²	TOTAL
746	7,288	682	9,871	18,587

¹Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY12 Facilities Support Requirements document, FY12 Navy Manpower Report, and FY18 projected Tables of Organization. Unit Deployed Program (UDP) personnel have been subtracted from these numbers.

2.1.2 Base Support District

The population within the Base Support District is comprised of daily employees and patrons of the many administrative, community support, and residential facilities. Based on FY18 force structure documents, daily employee loading for the Base Support District is estimated at approximately 580 total military and 617 civilians. MCB Hawaii Headquarters, base operations and maintenance facilities, supply, medical and dental, and a variety of MCCS facilities are located within this district. These uses have employees and generate many customers who come and go throughout the day, comprising the largest base loading component. Most employees and patrons live outside the Base Support District.

The Base Support District includes approximately 630 bachelor enlisted quarters (BEQ) rooms that can accommodate approximately 1,600 personnel. The majority of BEQ residents are assigned to aviation and ground units and work throughout MCB Hawaii Kaneohe Bay.

² Dependent personnel numbers have been derived using December 2012 Defense Manpower Data Center reports. Includes UDP personnel and their dependents.

2.2 Area Equipment Loading

Estimated equipment loading data was extracted from BFR documents for FY18. Base Motor Transport has a wide variety of rolling stock parked within the district's motor pool area, as shown in Table 2-2.

Table 2-2 Area Equipment Loading

UNIT	EQUIPMENT TYPE	NUMBER
Base Motor Transport	Small Vehicles and Forklifts	(b) $(7)(F)$
	Heavy Vehicles, Large Trucks, and Large Forklifts	
	C-pool, Vans, Small Trucks, and Buses	
	Refueler Trucks	
PM0	Patrol Cars and Trucks	

2.3 Facility Requirements

Basic Facility Requirements for the Base Support District were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of major facility requirements, existing assets, and facility surpluses and deficiencies in the Base Support District are presented in Table 2-3.

Table 2-3 **Base Support District Facility Requirements** (CCN 13115–CCN 21440)

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)	
13115	Communications Center	SF	23,360	17,785	(5,575)	
13140	Telephone Exchange Building	SF	11,210	6,226	(4,984)	
13160	Military Affiliate Radio Station (MARS)	SF	500	0	(500)	
13210	Antenna Communications	EA	7	0	(7)	
14160	Visual Information Facility	SF	8,703	9,877	1,174	
14345	(b) (7)(F)					
14378						
17110	Academic Instruction Building	SF	60,997	67,198	6,201	
17120	Applied Instruction Building	SF	4,300	5,242	942	
17177	Training Material Storage	SF	2,500	3,294	794	
17955	(b) (7)(F)					
17960	Parade and Drill Field	EA	0	1	1	
21420	Automotive Vehicle Maintenance Shop	SF	12,170	32,567	20,397	
21440	Vehicle Holding Shed	SF	6,300	750	(5,550)	

Table 2-3 **Base Support District Facility Requirements** (CCN 21451–CCN 73020)

(CCN 21451-CCN 73020)							
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)		
21451	Automotive Organizational Shop	SF	0	1,080	1,080		
21453	Field Maintenance Shop	SF	10,680	10,680	0		
21455	Vehicle Wash Platform	EA	0	4	4		
21456	Grease Rack	EA	2	1	(1)		
21710	Electronics/Communications Maintenance Shop	(b) (7)(F)					
21851	Battery Recharging Shop	SF	600	600	0		
21910	Public Works Shop	SF	28,700	49,354	20,654		
21920	Pavement and Grounds Equipment Shed	SF	1,100	2,920	1,820		
21977	Public Works Maintenance Storage	SF	15,700	18,140	2,440		
44112	Storage of Air or Ground Organic Units For Marine Corps	SF	175,436	229,842	54,406		
44120	Controlled Humidity Warehouse	SF	1,560	1,417	(143)		
44130	Hazardous and Flammable Storehouse	(b) (7)(F)					
44135	General Storage Shed	SF	1,004	920	(84)		
44172	ServMart	SF	6,398	6,231	(167)		
45110	Open Storage Area	SY	1,807	0	(1,807)		
54010	Dental Clinic	OU	41	28	(13		
55010	Primary Care Clinic	SF	39,380	35,610	(3,770)		
55030	Substance Abuse Rehabilitation Program Facilities	SF	2,281	2,281	0		
61010	Administrative Office	SF	149,287	187,470	38,183		
61040	Legal Services Facility	SF	17,200	17,596	396		
61072	Battalion Squadron Headquarters— CMC Only	SF	6,396	10,168	3,772		
61073	Company Battalion Headquarters— CMC Only	SF	0	7,680	7,680		
72121	Transient Quarters—Mission Essential	PN	68	73	5		
72124	Bachelor Enlisted Quarters—Marines E1/E4	PN	4,455	4,700	245		
72126	Bachelor Enlisted Quarters—Marines E6/E9	PN	18	36	18		
73010	Fire Station	SF	24,310	7,224	(17,086)		
73020	Security Building	(b)	(7)(F)				

Table 2-3 **Base Support District Facility Requirements** (CCN 73025–CCN 75060)

	(CCN 73025-CCN 75060)				
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
73025	Gate/Sentry House	SF	1,500	741	(759)
73082	Recycling Center	SF	19,740	7,764	(11,976)
74002	Location Exchange	SF	65,618	68,167	2,549
74016	Exchange Maintenance Shop	SF	29,425	9,063	(20,362)
74020	Temporary Lodging Facilities	SF	0	76,408	76,408
74025	Family Services Center	SF	8,753	13,431	4,678
74034	Thrift Shop	SF	4,000	5,725	1,725
74037	MWR Outdoor Recreation Center	SF	9,382	10,142	760
74038	MWR Auto Skills Center	SF	14,710	9,097	(5,613)
74040	Bowling Center	SF	35,224	17,040	(18,184)
74044	Indoor Physical Fitness Center	SF	96,856	20,320	(76,536)
74054	MWR Military Recreation Center	SF	10,900	7,281	(3,619)
74056	Theater	SF	17,200	12,775	(4,425)
74064	Enlisted Club	SF	0	24,975	24,975
74067	All Hands Club	SF	20,000	0	(20,000)
74076	Library	SF	20,640	8,572	(12,068)
74078	Recreation Pavilion	SF	4,000	1,088	(2,912)
74087	Marina Support Building	SF	15,600	4,704	(10,896)
74088	Educational Services Office	SF	21,500	18,120	(3,380)
74089	Bathhouse	SF	6,590	3,278	(3,312)
75010	Outdoor Playing Courts	EA	21	23	2
75020	Playing Fields	EA	10	10	0
75030	Outdoor Swimming Pool	М	75	25	(50)
75060	Marina/Boat Ramp	EA	1	1	0

2.4 Developable Real Estate

During the planning process, areas throughout the 260-ac Base Support District were assessed for their ability to accommodate future development or redevelopment, and were classified into four categories.

- Developable: Minimal natural and cultural constraints and free of buildings, roads, or parking
- Potentially Developable: Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Areas identified as Developable with Constraints include sites where existing facilities are outdated, in poor physical condition, or poorly sited. These sites provide opportunity for infill development. Infill development is the process of developing vacant or under-used parcels within areas that are already largely developed, and results in more compact development patterns, minimizes the need for new infrastructure (and may lower development costs due to proximity to existing infrastructure), and ensures that housing, work areas, and support services are close to one another. This approach supports MCB Hawaii's stated goals to create modern, efficient, and sustainable facilities and to consolidate functions. It also supports the goal of preserving land for training or recreational areas such as parks and greenspace. The potential availability of areas in the Base Support District for future development is shown on Figure 2-1.

2.5 District Assets

The Base Support District provides the primary point of entry to MCB Hawaii Kaneohe Bay via the main gate, and includes many of the administrative, public works, and community support facilities on the installation. Major administrative uses include the MCB Hawaii Headquarters (Building 216), legal services (Building 215), Headquarters Battalion (Building 4009), and MCCS (Building 219). Other base support functions in the district include public works facilities, fire station, Provost Marshal Office, base supply, active duty professional education, and BEQs. Utility assets include the water reclamation facility, the main electrical substation, and primary communication infrastructure. Major community support facilities include the medical clinic, fitness center, bowling alley, theatre, library, pool, enlisted club, swimming pool, outdoor playing fields and courts, the skate park, and the marina. A landing zone/VIP helipad and parade ground are also located in the district.

Major facilities and other landmarks are illustrated on the Base Support District Base Map (Figure 4-3) in Section 4.0, Base Maps.

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

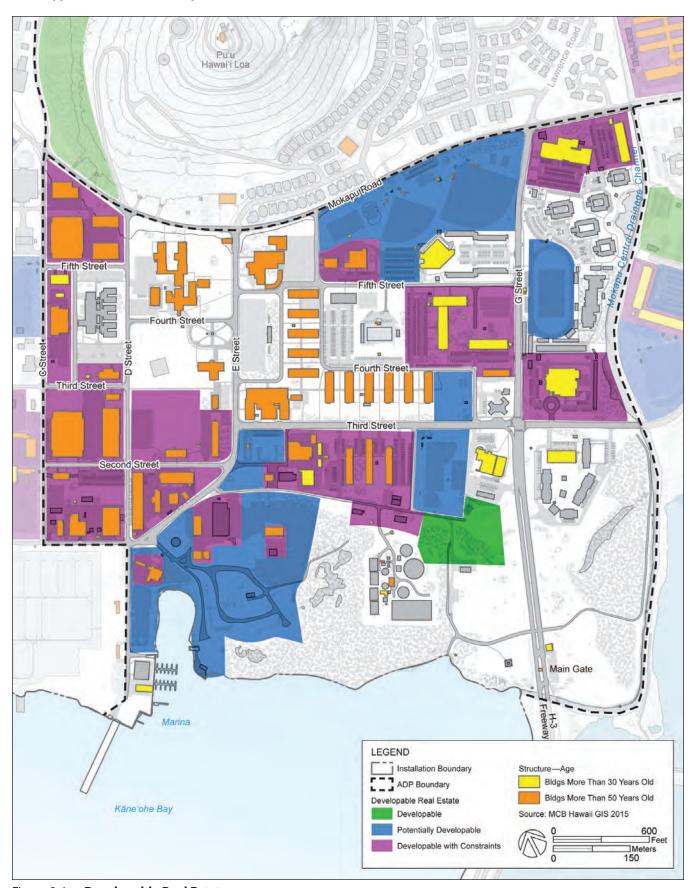


Figure 2-1 **Developable Real Estate**

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii installations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawai'i MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal Command Element functions/units do reside at various locations.

3.2 Base Support District Functional Relationships

Figure 3-2 illustrates functional relationships between major tenants and land uses within the Base Support District, which contains the MCB Hawaii Headquarters, various public works facilities (e.g., wastewater treatment plant), the fire station, communication node, PMO, base supply, professional education development center, and active duty and transient billeting. The central location of the district, with direct access to many areas of the installation, make this district uniquely situated to provide the breadth of support services located here.

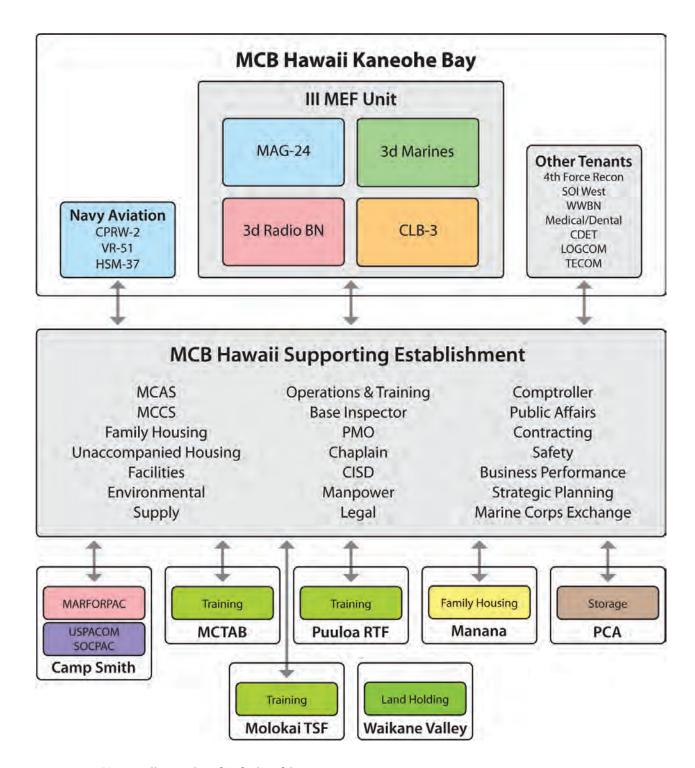


Figure 3-1 MCB Hawaii Functional Relationships

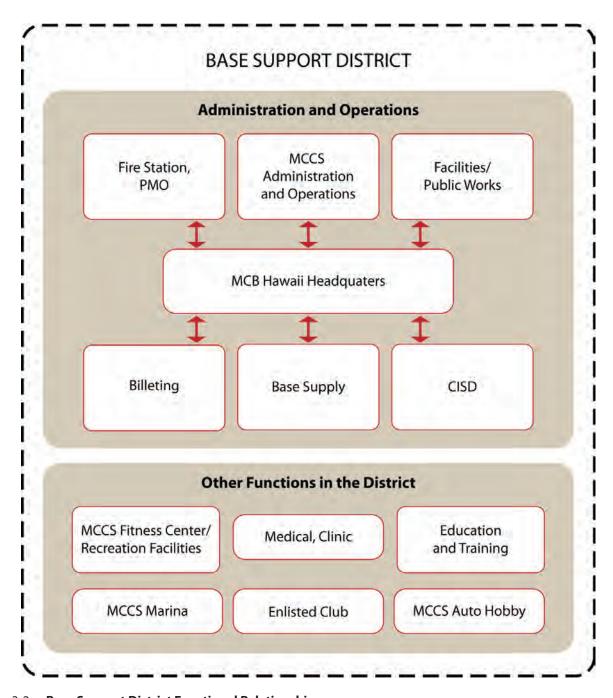


Figure 3-2 Base Support District Functional Relationships



4 Base Maps

Section 4 shows the Base Support District in the context of the neighboring Windward O'ahu community (Figure 4-1) in relation to the other areas of MCB Hawaii Kaneohe Bay (Figure 4-2). Figure 4-3 highlights major facilities and the physical geography of the district.

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Section 4 | Base Maps 17

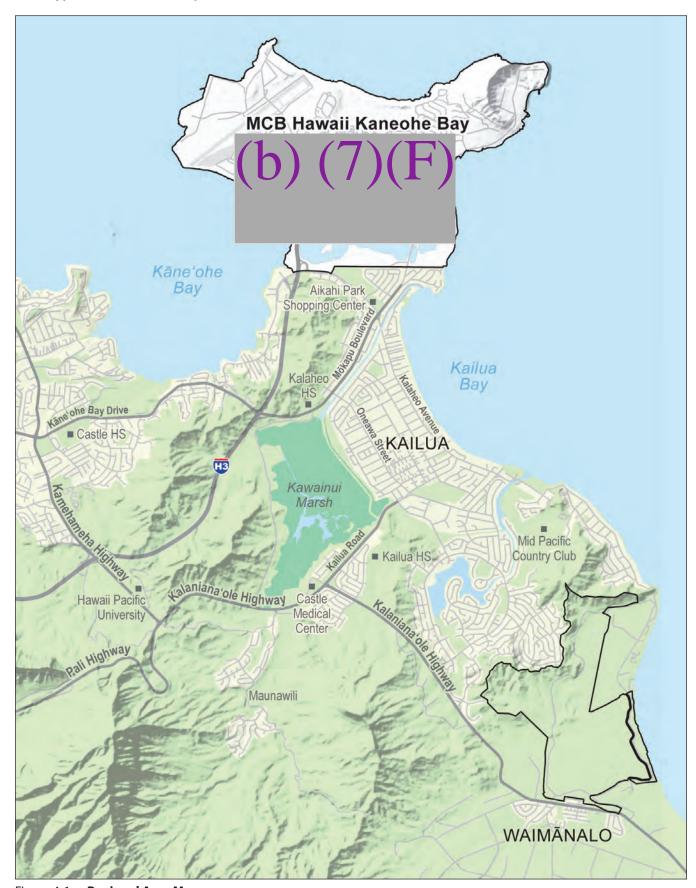


Figure 4-1 Regional Area Map

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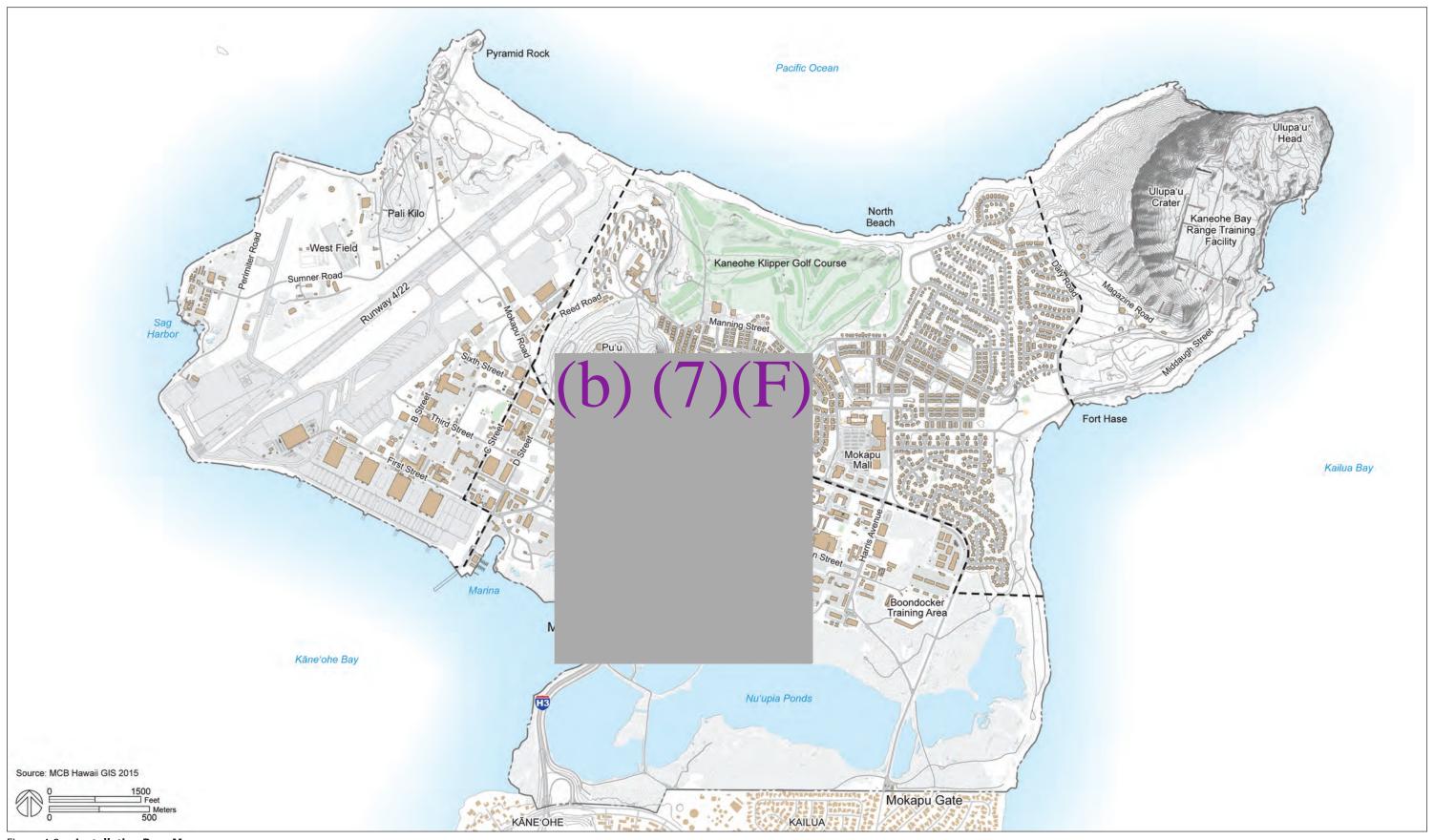


Figure 4-2 **Installation Base Map**



Marine Corps Base Hawaii Installation Master Plan Base Support District Area Development Plan

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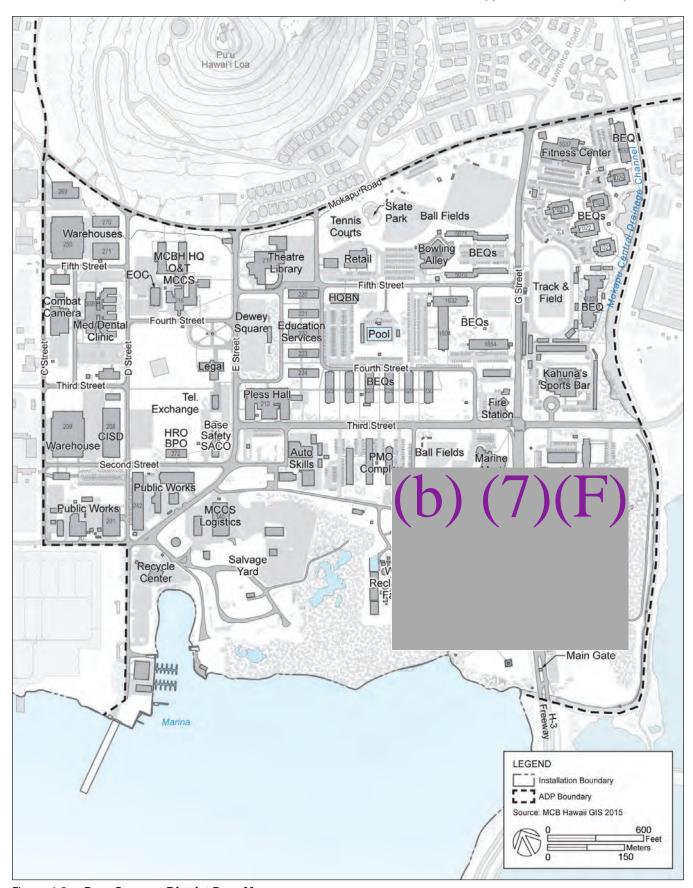


Figure 4-3 Base Support District Base Map

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Marine Corps Base Hawaii Installation Master Plan Base Support District Area Development Plan

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5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and geographic information system (GIS) and facility databases were all primary information sources contributing to the development of the *Base Support District ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating in the district. Stakeholders also participated in a four-day charrette followed by a three-day concept workshop to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

U.S. Marine Corps. Marine Aviation Plan. 2015.

The Aviation Plan was prepared under the authority of Marine Corps Deputy Commandant for Aviation and covers the topics of the Marine Corps Operational Landscape, Expeditionary Aviation Program and Concepts, and the Marine Aviation Organization and Enterprise. A *Marine Aviation Almanac* is also provided.

U.S. Marine Corps Community Services. PVA for Self-Storage Facility. Draft Report. Prepared by AECOM. October 2014.

This study assesses the feasibility of a self storage facility for Marine Corps Community Services at MCB Hawaii Kaneohe Bay. Four build options were evaluated based on market data, site, conceptual design, cost, and financial feasibility. The study recommends that MCCS consider Option 1 at a site on Palikilo Road. This option provides the maximum amount of necessary climate-controlled storage for the MCB Hawaii community and would have a project cost of \$9.65 million.

Marine Corps Base Hawaii. Marine Corps Base Hawaii Kaneohe Bay Parking Study, Final Report. Prepared by Belt Collins Hawaii, Weslin Consulting. August 2014.

The parking study analyzed the installation's parking assets and requirements and identified areas with parking surpluses and deficits. Strategies were developed to provide for the growing demand for parking.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance

Base Support District stakeholders included representatives from the following units and departments.

MCB Hawaii Leadership and Administration

Marine Corps Forces Pacific

Marine Corps Installation Command

3d Marine Regiment

1st Battalion, 12th Marine Regiment

Combat Logistic Battalion 3

Marine Aircraft Group 24

Wounded Warrior Battalion

21st Dental Company

Navy Health Clinic Hawaii

Provost Marshall's Office

Operations & Training Department

Unaccompanied Personnel Housing Department

Facilities Department

Public Works Department

Communications Information Systems Directorate

Environmental Department

Energy Department

Marine Corps Community Services

Naval Facilities Engineering Command Pacific

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actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities, and other planning documents and metrics.

U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The Optimization Study was prepared in response to an ongoing Department of Defense (DoD) process to evaluate the realignment of forces in the Pacific Region. The study identifies development opportunities that may be used to satisfy long-term requirements associated with relocation of units from Okinawa under the Defense Policy Review Initiative.

Marine Corps Base Hawaii. Base Exterior Architectural Plan. Draft. December 2013.

The Base Exterior Architectural Plan presents both recommendations and guidelines to establish proper and consistent visual design of buildings and sites at MCB Hawaii Kaneohe Bay. The document analyzes existing base conditions and presents requirements and guidelines on site planning, landscape design, roadway design, architecture, and signage.

Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Utility System Capacity Study, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared by Helber Hastert & Fee Planners and HDR Engineering, Inc. October 2013.

The primary objective of this study was to determine the overall impacts of proposed military construction (MILCON) and non-appropriated funds projects in the flight line area on water and wastewater systems. The evaluation area was limited to the area bounded by D Street, Reed Road and the west boundary of the flight line area along Sumner Road and Perimeter Road. The study recommended water and wastewater improvement projects to upgrade and correct service deficiencies at the flight line.

Marine Corps Base Hawaii Kaneohe Bay. MCB Hawaii Kaneohe Recycling Center Planning Study, Final Report. Prepared by Belt Collins Hawaii. August 2013.

This study evaluated three alternatives for the existing Recycling Center, located on a 1.4-ac site near the southwest shoreline of MCB Hawaii Kaneohe Bay. Basic facilities requirements were updated and options evaluated for 1) renovation and 2) new construction for a 2.5-ac study area. An economic analysis concluded that a third alternative, the status quo or continuing current operations, was substantially more cost-effective when compared to the renovation and new construction alternatives.

Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. May 2013.

The environmental assessment (EA), prepared in accordance with the National Environmental Policy Act, evaluates a proposal to provide suitable sites on DoD installations in Hawai'i to a private entity for the installation and operation of

photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on DoD installations on O'ahu and Kaua'i.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Hawaii Division. Bicycle Route Planning Study for Marine Corps Base Hawaii Kaneohe Bay. Prepared by Belt Collins Hawaii LLC et al. December 2012.

MCB Hawaii Kaneohe Bay seeks to encourage alternative modes of transportation within the base, particularly bicycling. This study included an extensive user survey, and identified and evaluated four alternative approaches to implementing a bikeway system to meet user demands and encourage ridership. The recommended alternative proposes a bikeway system using bike routes, bike lanes, bike paths, and shared use paths.

Department of the Navy. Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i. Volumes I and II. June 2012.

The environmental impact statement assessed potential environmental impacts associated with the proposed basing of MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. The introduction of these aircraft in Hawai'i is part of the Marine Corps' plan to restructure and rebase its forces in the Pacific over the next 10 years.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Pacific Division. Final Marine Corps Base Hawaii Warehouse Study. Prepared by Belt Collins Hawaii LLC. June 2012.

The study evaluated existing warehouse and supply conditions at MCB Hawaii. It found that warehouse facilities are not optimized for space usage, primarily due to "stovepipe" management, where each unit has direct control of material needs. This results in operational effectiveness, but also unnecessary laydown space. Additional storage requirements were projected. To correct existing inefficiencies, the plan proposes to utilize modern technologies, optimize existing facilities, consolidate like users, and construct a new warehouse.

Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

The INRMP provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

NAVFAC Pacific. Traffic Impact Report for the Marine Aviation Plan to Locate MV-22 and HMLA Squadrons at MCB Hawaii Kaneohe Bay, Kaneohe, Hawaii. Prepared by Julian Ng, Inc. September 2011.

The report looked at the traffic impacts of locating MV-22 and HMLA squadrons at MCB Hawaii Kaneohe Bay. Recommendations for roadway improvements were identified to address existing and future traffic conditions.

Naval Facilities Engineering Command (NAVFAC) Pacific. Electrical Utility System Assessment MCB Hawaii, Kaneohe, Hawaii. March 2011.

The purpose of the Electrical Utility System Assessment was to review the power requirements of future MILCON projects and assess their impact on the MCB Hawaii Kaneohe Bay primary electrical distribution system. The entire system was surveyed, and existing capacity, condition, and reliability were assessed.

Naval Facilities Engineering Command, Pacific. (b) (7)(F)

Kaneohe Bay. Prepared by (b) (7)(F)

Belt Collins Hawaii Ltd. April 2007.

The study provides design measures to improve security at MCB Hawaii



Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

The Master Plan provided land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provides baseline information on environmental conditions that remain relevant.

Pacific Division, Naval Facilities Engineering Command, Pearl Harbor Hawaii. Mokapu Central Drainage Channel Study, Marine Corps Base Hawaii, Kaneohe Bay. Prepared by Hawaii Pacific Engineers. February 2002.

This study is an assessment and refinement of a 1995 study of the Mokapu Central Drainage Channel, located in the central part of MCB Hawaii Kaneohe Bay. The channel conveys stormwater runoff in a north to south direction from the Kaneohe Klipper Golf Course through the base before discharging into Kāne'ohe Bay near Nu'upia pond. Refinements included development of more accurate topographic data for the channel; developing channel flow rates at more frequent intervals corresponding to locations of actual inputs; and a hydraulic analysis at more frequent intervals along the channel, using the updated topographic and channel flow data. Based on the hydraulic analysis, recommendations were made for prioritizing drainage system improvements and estimated budgetary construction costs were provided.

6 ADP Area Analysis

Section 6, ADP Area Analysis, presents the regional, offsite, and onsite conditions related to the Base Support District. Section 6.1 Regional Context, describes the neighboring civilian community. Section 6.2, Offsite Conditions, describes the general physical characteristics of MCB Hawaii Kaneohe Bay. Section 6.3, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resource constraints within the Base Support District. Plan alternatives for the Base Support District were developed and evaluated, and a recommended Area Development Plan is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Base Support District is located within the boundaries of MCB Hawaii Kaneohe Bay, located on Mōkapu Peninsula on the windward side of Oʻahu. Mōkapu Peninsula is bordered by Kāneʻohe Bay on the west, Kailua Bay to the east, and the Pacific Ocean to the north. On its south side, MCB Hawaii Kaneohe Bay abuts civilian lands, including a residential neighborhood of Kailua town, a city and county of Honolulu wastewater treatment plant, and portions of Kāneʻohe town. The combined population of the Kāneʻohe/Kailua region is approximately 82,750 residents, with approximately 44,100 residing in Kāneʻohe and 38,650 residing in Kailua (U.S. Census 2010). Both Kailua and Kāneʻohe are primarily residential bedroom communities that include regional commercial, civil, and medical services.

Windward Oʻahu is separated from the more densely populated and urbanized city of Honolulu by the Koʻolau mountain range. Access to MCB Hawaii Kaneohe Bay from Honolulu is available via three highways that tunnel through the Koʻolau mountain range—the Likelike Highway 63, Pali Highway 61, and the John A. Burns H-3 Freeway. Oahu Transit Services provides county bus service to MCB Hawaii Kaneohe Bay. Regular off-base service is provided by Route 56 with multiple stops located within walking distance of the main and Mokapu gates. On-base service is provided by Route 70 five times daily between 0750 and 1400.

See Section 4, Figure 4-1, Regional Area Map, for a map showing the Base Support District in the context of windward O'ahu.

6.2 Offsite Conditions

This section describes the general physical characteristics of the entire MCB Hawaii Kaneohe Bay installation.

6.2.1 Geology

The Mōkapu Peninsula was formed by basaltic lava eruptions from four separate volcanic vents during the last period of volcanic activity on Oʻahu. Major volcanic features of the peninsula include Kūʻau or Pyramid Rock on the northwestern tip of the installation, Puʻu Hawaiʻi Loa in the central area, and Ulupaʻu Crater on the northeastern tip.

Following this volcanic activity, the peninsula was inundated by a rise in sea level, during which time an extensive coral reef was formed. As sea level retreated to its present level, beaches and sand dunes were formed from the deposition of calcareous sand by the prevailing tradewinds. Approximately 280 ac of coral fill were added to the peninsula's marshy central drainage basin between 1939 and 1941 to both deepen the sea channel for marine vessels and create a runway (Department of the Navy 2006).

6.2.2 Topography

Topography at MCB Hawaii Kaneohe Bay generally slopes toward the Nu'upia Ponds, with coastal areas sloping toward the shores. The three volcanic highpoints, Pyramid Rock, Pu'u Hawai'i Loa, and Ulupa'u Crater, are at elevations of approximately 75 ft, 330 ft, and 665 ft above mean sea level (msl), respectively. Elevation in the Base Support District ranges from zero to 25 ft above msl with no significant slope.

6.2.3 Hydrology

The Mokapu Central Drainage Channel is a lined stream channel that runs through much of the base and empties into the Nu'upia Ponds, and ultimately into Kāne'ohe Bay. Several watershed improvement projects have been conducted over the years in the vicinity of the drainage channel to remove invasive weeds and replace them with native plants. These wetland and watershed projects have increased stormwater retention capacity, reduced sedimentation into the Nu'upia Ponds and Kāne'ohe Bay, and improved water quality. The projects have also created a more aesthetically pleasing environment and improved habitat for native waterbirds.

There are approximately 131 ac of U.S. Army Corps of Engineers jurisdictional wetlands at MCB Hawaii Kaneohe Bay, covering five sites. The largest concentration of wetlands are in and around the Nu'upia Ponds. Pockets of wetland are located within the golf course, next to the salvage yard, and at West Field.

6.2.4 Soils

Soil types identified at MCB Hawaii Kaneohe Bay range from clay to fine beach sand and are shown on Figure 6-1. The majority of soils on the installation consist of well-drained soils developed from coral, lava, and/or alluvium, which provide a solid foundation for construction. Makalapa Clay (Mt, MdC), a prominent soil type around the slopes of Ulupa'u Crater, has high expansion and contraction potential that makes it poor for construction purposes. Soils associated with Rock Land (rRK) have similar expansion and contraction characteristics (Department of the Navy 2006).

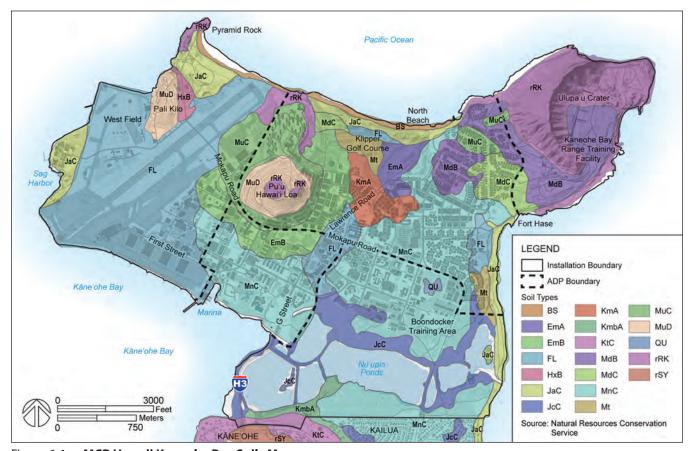


Figure 6-1 MCB Hawaii Kaneohe Bay Soils Map

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild tradewinds, while winter has higher rainfall, cooler temperatures, and stronger tradewinds. The predominant wind direction in the Hawaiian Islands is from the east–northeast at 10 knots.

In the vicinity of MCB Hawaii Kaneohe Bay, the median annual rainfall is approximately 40 in. Monthly average low and high temperatures at MCB Hawaii Kaneohe Bay range from 76 to 85 degrees Fahrenheit in the warmest month (September) and from 69 to 79 degrees Fahrenheit during the coolest month (January).

6.2.6 Vegetation

Most of the developed land and open space at MCB Hawaii Kaneohe Bay contains planted landscape material, typically Bermuda grass and a variety of native and non-native planted trees and shrubs. The non-managed dry land vegetated areas, including around Pu'u Hawai'i Loa and Ulupa'u Crater, are dominated by non-native *koa haole* (*Leucanena leucocephala*) shrubland. Undeveloped shoreline areas include native sea strand vegetation.

According to the INRMP (2011), since 2008, natural resources staff have discovered several 'ōhai (Sesbania tomentosa) plants in the dune vegetation next to the shearwater colony on the Kailua Bay side of the installation. 'Ōhai is listed as a federal endangered species. The plants have been placed in custom built cages to protect them from rodents, and the area is monitored regularly by MCB Hawaii environmental staff. There are no other natural occurrences of plants currently listed or pending listing as endangered under the Federal Endangered Species Act (Marine Corps Base Hawaii 2011 and Department of the Navy 2006).

6.2.7 Wildlife Habitat

There are two designated wildlife management areas (WMA) at MCB Hawaii Kaneohe Bay: the 482-ac Nu'upia Ponds WMA and the 23-ac Ulupa'u Head WMA. The Nu'upia Ponds WMA provides habitat for endemic, endangered water birds, shorebirds, and seabirds and provides refuge to 16 native fish species. The Ulupa'u Head WMA is one of two red-footed booby or 'Ā (Sula sula rubripes) colonies in the main Hawaiian islands. Although not a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many of the same waterbirds, shorebirds, and seabirds.

Endangered Hawaiian water bird species that feed and breed at MCB Hawaii Kaneohe Bay include the endemic Hawaiian duck or *koloa maoli (Anas wyvilliana)*, the endemic Hawaiian coot or *'alae ke'oke'o (Fulica americana alai)*, the endemic Hawaiian moorhen or *'alae 'ula (Gallinula chloropus sandvicensis)*, and the endemic Hawaiian stilt or *ae'o (Himantopus mexicanus knudseni)*. The

Newell's shearwater or 'a'o (Puffinus auricularis) is a federal-listed threatened species that has been observed in the area. The endemic short-eared owl or pueo (Asio flammeus sandwichensis) is included on the state list of endangered species and has also been observed in the area.

The waters off MCB Hawaii Kaneohe Bay are home to four federal-listed endangered species of animals, including the endemic Hawaiian monk seal or *'ilio holo i ka uaua (Monachus schauinslandi)*, the sperm whale (*Physeter catodon*), the migratory humpback whale or *koholā (Megaptera novaeangliae)*, and the migratory hawksbill sea turtle or *'ea (Eretmochelys imbriacata)*. The green sea turtle or *honu (Chelonia mydas)* is a federal-listed threatened species that has been observed in the area (MCB Hawaii 2011).

6.3 Onsite Conditions

The Base Support District is located at the south central portion of the Mōkapu Peninsula and is the primary entry point to the installation via the main gate. The district is bordered by C Street to the northwest, Mokapu Road to the northeast, the Mokapu Central Drainage Channel to the southeast, and Kāne'ohe Bay on the southwest. The district abuts three other planning districts—the Aviation District, the Community Support District, and the Ground Support District.

6.3.1 Land Use

Figure 6-2 illustrates land use within the Base Support District, which includes a mix of administrative, medical, light industrial, recreation, supply, billeting, and community support. Major administrative uses include the MCB Hawaii Headquarters (Building 216), Legal Services (Building 215), Headquarters Battalion (Building 4009), Facilities Department (Building 242), and MCCS offices (Building 219). Many of the installations community support facilities are located within the district, including the fitness center, bowling alley, enlisted club, auto skills center, thrift store, theater, library, marina, and outdoor courts and playing fields. The parade ground at Dewey Square and adjacent fields are used for unit formations and training. Lands within this district are under the control of the federal government and are not subject to any state or county land use controls or public access entitlements.

6.3.2 Transportation Network

Figure 6-3 shows the transportation network and major parking areas within the Base Support District. (b) (7)(F)

network of pathways that extend throughout the district. The only dedicated bike lane begins at the main gate and continues east on Third Street into the Ground Support District. The main gate entry control point (ECP) has two lanes, although typically only one is open during non-peak morning hours. The ECP does not meet current design and security standards.

Lack of privately-owned vehicle (POV) parking is a major issue in the Base Support District. The *Marine Corps Base Hawaii Kaneohe Bay Parking Study* (2014) identified a shortfall of approximately 800 stalls within the district.

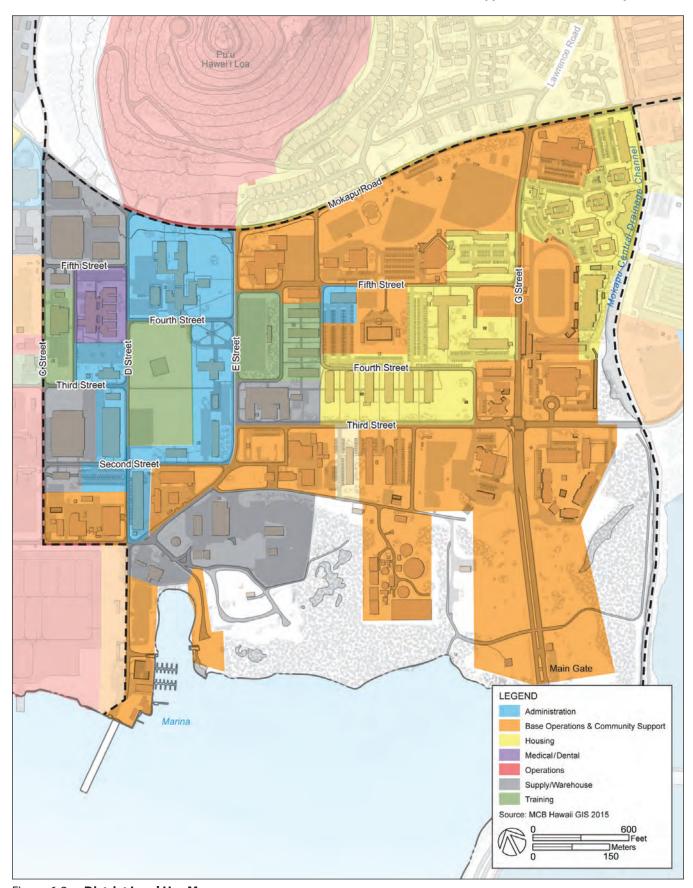


Figure 6-2 **District Land Use Map**

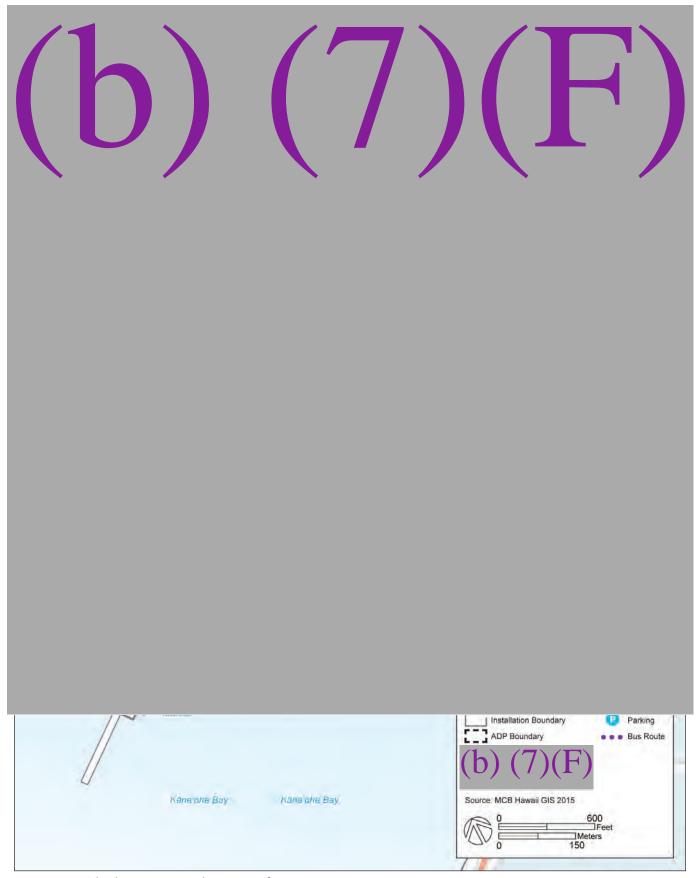


Figure 6-3 **District Transportation Network Map**

6.3.3 Utilities

This section provides an overview of the water, electrical, wastewater, storm drainage, and communication systems at MCB Hawaii Kaneohe Bay and highlights utility issues specific to the Base Support District.

Water System

Figure 6-4 illustrates the water distribution system in the Base Support District. In general, the water supply, distribution, and storage capacity at MCB Hawaii Kaneohe Bay is adequate for existing and future needs in the Base Support District. Future development in the Salvage Yard requires extending the existing water distribution system.

The Base Support District is served by the MCB Hawaii Kaneohe Bay water system, which is operated and maintained by the MCB Hawaii Facilities Department Maintenance Division. The potable water distribution system includes approximately 240,000 ft of water lines, two pump stations, five reservoirs, altitude valves, sectional valves, service valves, pressure regulating valves, fire hydrants, water meters, and a chlorination and fluoridation facility. Water comes

BWS is under contract to provide 5,200 gallons per minute at 60 pounds per square inch (psi); however, actual service since 1999 has ranged from 100 to 110 psi. Daily water use measures approximately two million gallons per day with adequate pressure for all existing general uses. (b) (7)(F)

needed. The capacity of the transformer supporting this facility limits the number of pumps that can operate at the same time, thereby limiting the amount of water pressure the installation can organically generate. There are no potable water wells on MCB Hawaii Kaneohe Bay.

Wastewater System

Figure 6-5 illustrates the wastewater collection system in the Base Support District. The wastewater collection system is generally adequate to support an increase in population, although future sewer line upgrades and pump station capacity upgrades may be necessary depending on the location of proposed development.

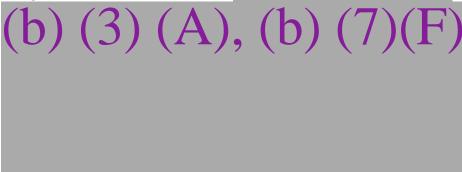
The MCB Hawaii Kaneohe Bay wastewater collection system is operated by the MCB Hawaii Facilities Department. The wastewater collection system is comprised of approximately 920 manholes, 171,800 ft of gravity sewers and force mains, and 20 pump stations. Wastewater is collected and conveyed to the Water Reclamation Facility (WRF) located west of the main gate in the Base Support District. The WRF is a secondary biological treatment plant. MCB Hawaii seeks to upgrade the treatment and electrical systems of the plant in the near-term to provide redundant critical systems. Some treated R2-quality effluent is

typically pumped to the Kaneohe Klipper Golf Course for irrigation while the rest is routed to the City and County of Honolulu Kailua Wastewater Treatment Plant for discharge through the Mōkapu deep ocean outfall under a National Pollutant Discharge Elimination System permit from the State of Hawai'i Department of Health (HHF Planners 2013).

Electrical System

Figure 6-6 illustrates the electrical distribution system in the Base Support District. MCB Hawaii Kaneohe Bay is served from the 37.5 megavolt ampere (MVA) (b) (3) (A), (b) (7)(F) (b) (3) (A), (b) (7)(F)

Kailua (46 kV) HECO circuits. The Mokapu Substation steps down the incoming voltage to 11.5 kV, which is then fed to the (b) (3) (A), (b) (7)(F)



In 2013, a final EA and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV in non-family housing areas in partnership with NAVFAC Hawaii. Sites approved for PV installation in the Base Support District are also shown on Figure 6-6.

Communications Infrastructure

Communication infrastructure within the Base Support District includes

(b) (3) (A), (b) (7)(F) (b) (3) (A), (b) (7)(F)

and connection to off-installation

telecommunication networks. Infrastructure is located in underground conduits across the district.

Stormwater Management System

The MCB Hawaii Kaneohe Bay storm drainage system includes box culverts, drainage pipelines, and ditches, as shown on Figure 6-7. Over 20 storm drain outlets discharge into Kāne'ohe Bay, Kailua Bay, and Nu'upia Ponds. No reports exist regarding significant flooding issues during storm events in the Base Support District.

Solid Waste Disposal

MCB Hawaii provides solid waste collection and disposal for administrative, industrial, military, commercial, and bachelor quarters areas of MCB Hawaii Kaneohe Bay. Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupa'u Crater. Waste amounting to approximately 5,000 tons per year is placed in the landfill. At the present rate of waste generation, the landfill site should accommodate MCB Hawaii Kaneohe Bay's requirements for another 10–20 years, provided there are no changes in current regulations and cover material is readily available. However, the Environmental Department is currently conducting a study to evaluate permanently closing the landfill prior to it reaching capacity. A commercial contract service collects solid waste from public-private venture (PPV) family housing areas for disposal at off-base facilities.

The Environmental Department operates a recycling center in Building 132 next to the marina. Traditional recyclables, wood pallets, and reusables from operational, maintenance, administrative, bachelor quarters, and community support areas are accumulated and processed for sale or for on-base reuse.

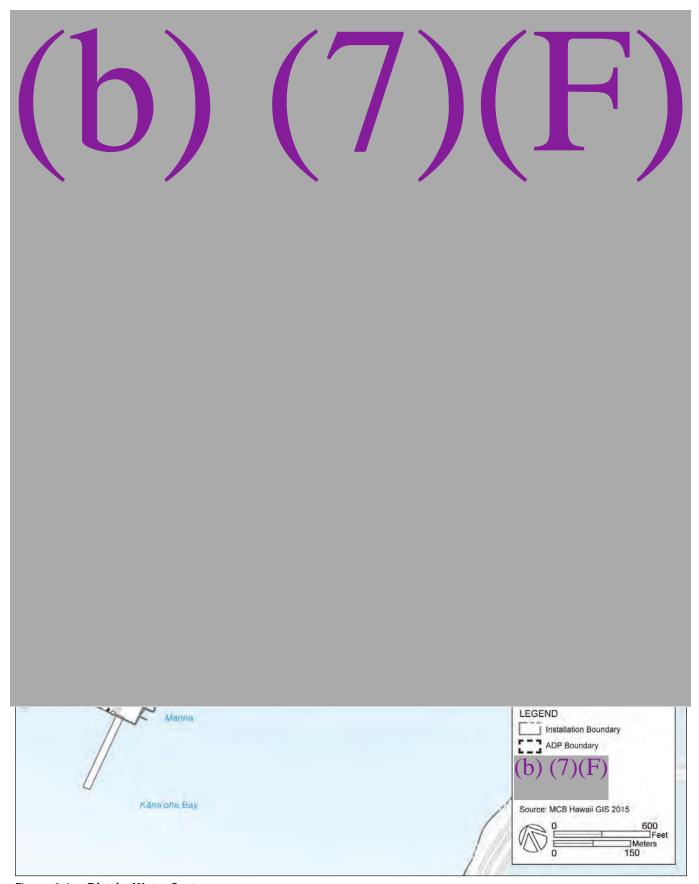


Figure 6-4 **District Water System**

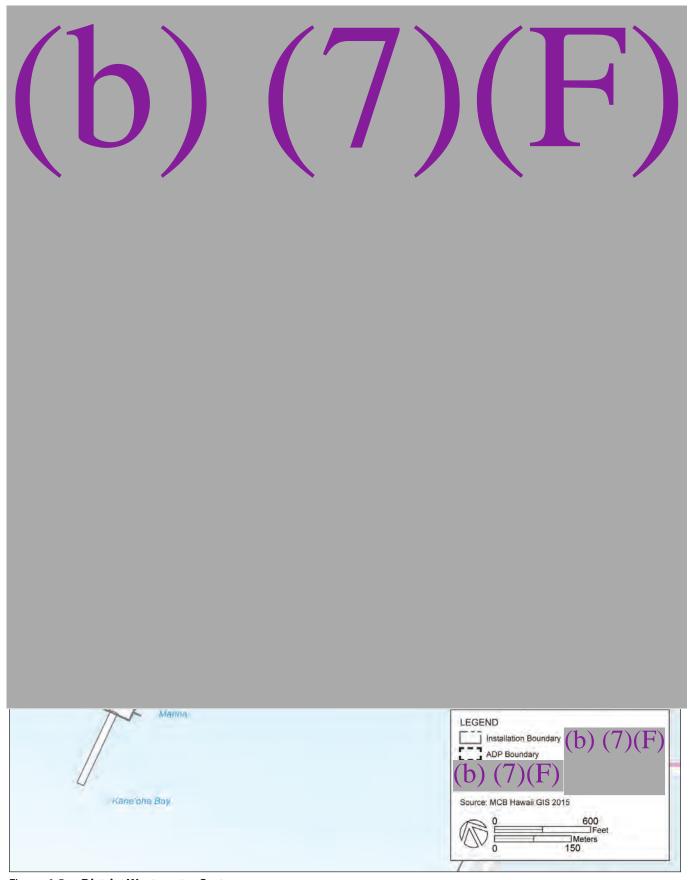


Figure 6-5 **District Wastewater System**

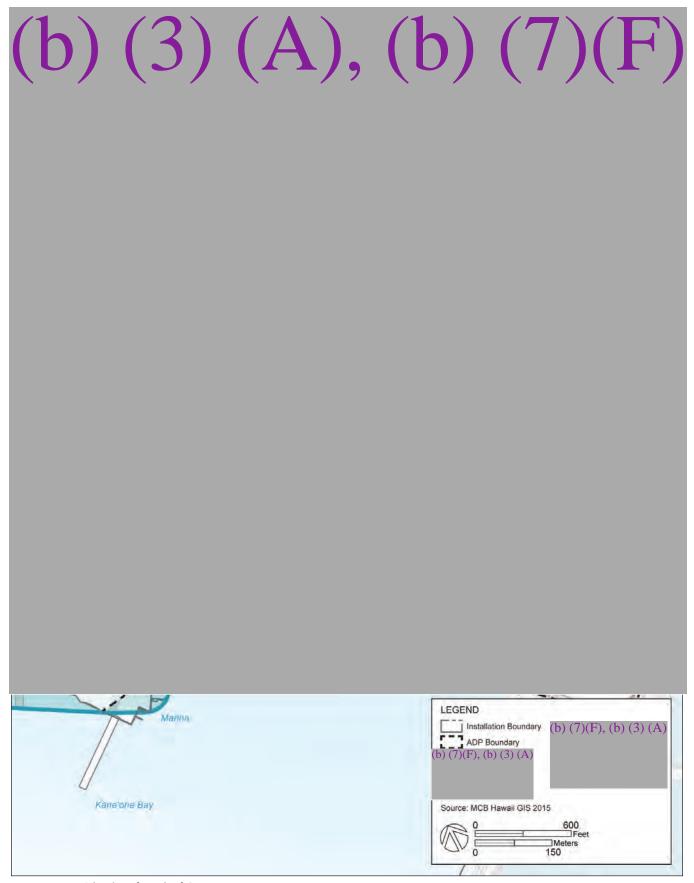


Figure 6-6 **District Electrical System**



Figure 6-7 **District Stormwater Management System**

6.3.4 Environmental Conditions and Hazards

Figure 6-8 highlights specific environmental resources and hazards found in the Base Support District.

Flood Plain

According to the Federal Emergency Management Agency the entirety of the Base Support District is designated Flood Zone D, an area where flooding is possible but risk is undetermined. Within Flood Zone D, 10-yr- and 100-yr-flood hazard areas associated with the Mokapu Central Drainage Channel have been identified (Department of the Navy 2002, Rev. 2003).

Wetland

Three wetland areas have been identified in the Base Support District, including a 9-ac wetland in the salvage yard, a 0.85-ac wetland south of the temporary lodging facility, and a 0.45-ac wetland west of the main gate. All three wetlands are in the intertidal zone and regularly flood. A 100-ft buffer ensures natural vegetation cover is maintained and prevents development encroachment.

Wildlife Habitat

The western edge of the Nu'upia Ponds WMA is included in the Base Support District.

Installation Restoration Program Sites

Installation Restoration Program (IRP) sites are locations where releases of hazardous materials or petroleum products require remediation or other follow-up efforts. Environmental remediation is completed under the MCB Hawaii IRP. There are three IRP sites in the Base Support District. The H-3 landfill site has been closed but may require further action should on-site development be pursued in the future. Further action is recommended for the salvage yard waste storage area. No further action is required at the fuel oil pipeline east of D Street by the marina.

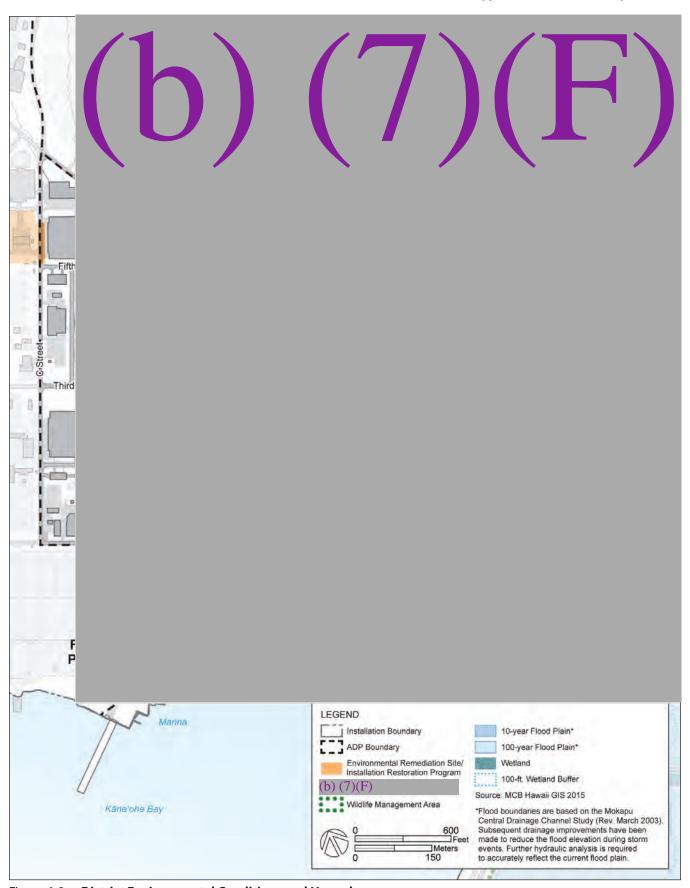


Figure 6-8 **District Environmental Conditions and Hazards**

6.3.5 Historic Architectural Resources

MCB Hawaii Kaneohe Bay has three historic districts—containing World War II historic facilities—which have been evaluated as eligible for listing in the National Register of Historic Places (NRHP). One of these, the "Naval Air Station Kaneohe Administration District," is located within the Base Support District. The location of this NRHP eligible historic district is shown on Figure 6-9. This historic district has been recommended as eligible for listing on the NRHP under Criterion A, having association with "events that have made a significant contribution to the broad patterns of our history."

The following description is from the district's NRHP nomination form. (ICRMP 2014, pg. II–56)

The proposed NAS Kaneohe Administration District includes facilities initially built as administration, recreation, and enlisted bachelor housing to support the aviation mission of Naval Air Station Kaneohe. The business of the air station took place in this area.

The proposed Administration District was an essential part of the master plan of NAS Kaneohe designed by the Navy Bureau of Yards & Docks in 1939. Most of the buildings were constructed in 1941 and are concrete, one to two stories high. The major contributing resources include the original base dispensary, administration building, telephone exchange building, eleven barracks buildings, mess hall, a small brig, command center, gate house, and recreation facility. These buildings are configured around the parade grounds, Dewey Square.

A small portion of the proposed "Naval Air Station Kaneohe Bay Aviation District" and three additional NRHP-eligible structures, all Public Works shops (Buildings 201, 202, and 203), are also located within the Base Support District.

Treatment of this district and facilities must follow regulations and processes per *Marine Corps Order PS090.2A* and *Sections 106* and *110* of the *National Historic Preservation Act of 1966, as Amended*. There are no identified archaeological resources in the Base Support District.

6.3.6 Safety Hazards

No safety hazards exist related to military operations that constrain land use in the Base Support District.

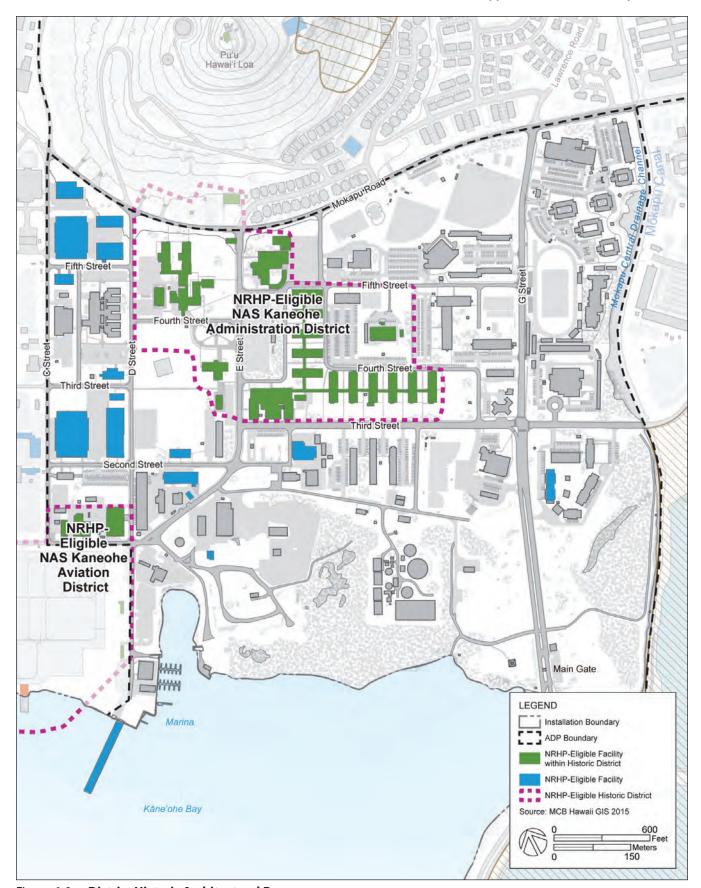


Figure 6-9 **District Historic Architectural Resources**

6.3.7 AT/FP and Physical Security

AT/FP measures are intended to protect personnel, infrastructure and critical resources from attack. The AT/FP guidance mandate that measures be taken in both site and building design, which can have an appreciable impact on site and building planning as well as on construction cost. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-1*, *Installation Master Planning* (May 2012). Figure 6-10 shows lands in the Base Support District encumbered by the standoff distances for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries. The waters immediately surrounding the Base Support District are used by Marines for various activities, including helicopter search and rescue training and amphibious landing training. Access within a 500-yard buffer surrounding the installation is restricted due to its designation as a Naval Defensive Sea Area.



6.3.8 Sources of Air, Noise, and Light Pollution

There are no reported sources of air or noise pollution in the Base Support District. Night time light sources associated with urbanization are an ongoing concern for migratory seabirds.

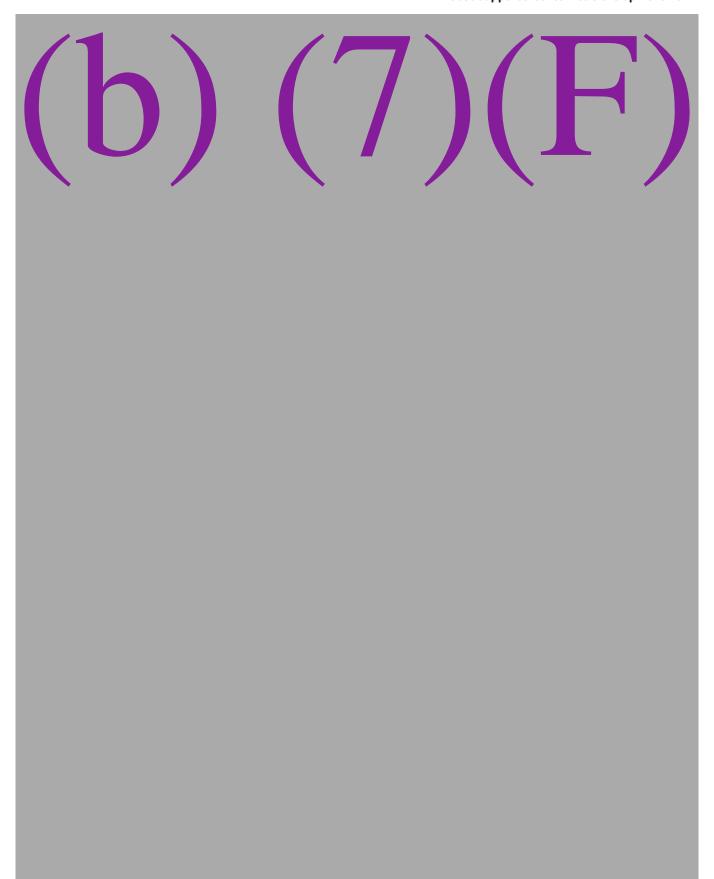


Figure 6-10 District AT/FP and Physical Security Map

6.4 Alternative Site Development and Evaluation

Alternative site development plans were developed through a multistep process involving key installation stakeholders, including representatives from MCB Hawaii departments, operational commands, and other supporting elements. A four-day charrette allowed participants to develop a variety of possible planning actions to address identified facility and land use issues in the Base Support District. These concepts were revised and presented as alternatives to stakeholders at a three-day concept workshop where they were evaluated. Additional guidance and direction was also provided for further plan refinement. The alternatives considered different options for the following.

- · Consolidation of operations and reuse of administrative buildings
- Redevelopment of the PMO complex
- Identification of locations to address fitness center requirement shortfall
- Development options at the Salvage Yard, including scenarios that include different design concepts to accommodate the Motor Transport complex, PMO kennels and impound lot, deployment parking lot, marina expansion and additional boat storage slips, MCCS self-storage facility, and upgraded recycling center
- Redevelopment of the warehouse district
- Identification of locations for a Marine Wing Support Detachment (MWSD) organizational parking lot

The Charrette Summary Report (IMP Appendix A) and Concept Workshop Report (IMP Appendix B) document the attendees, planning concepts, plan alternatives, and evaluation of the alternatives during the plan development process. Subsequent to the concept workshop, a preferred alternative for the Base Support District was presented to MCB Hawaii leadership. Leadership's final guidance is reflected in the ADP presented in Section 6.5. One alternative proposal not carried forward in the Base Support District ADP is the construction of a MWSD organizational parking lot at the site of Building 250. An adjacent location across C Street in the Aviation District is identified as the preferred location for this facility.

6.5 Area Development Plan

This section presents the ADP for the Base Support District at MCB Hawaii Kaneohe Bay. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific district-level goals and objectives. Future development envisioned for the Base Support District is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.5.1 Illustrative Plan

The Illustrative Plan graphically portrays planned, programmed, and recommended future development that supports the overarching planning goals for MCB Hawaii Kaneohe Bay. Figure 6-11 represents an optimized administrative and base support area that prioritizes building reuse and appropriately sites functions to maximize the potential of prime lands while preserving the character of the proposed historic district. Important plan features culminating from the IMP planning process are described in detail as follows.

Renovate Building 3089

Renovate Building 3089 for reuse by MCCS Marine and Family Programs, the Substance Abuse Counseling Center, the Installation Personnel Administration Center (IPAC), and the Defense Enrollment Eligibility Reporting System (DEERS). Existing medical clinic operations will vacate after the Defense Health Agency Medical/Dental Clinic Replacement project (P-78150) is completed in the Ground Support District. The replacement project is currently expected to be awarded by April 2016.

Reuse Portion of MCB Hawaii Headquarters (Building 216)

Reuse a portion of MCB Hawaii Headquarters (Building 216) for MCB Hawaii Headquarters Battalion (HQBN) administrative offices. MCCS Marine and Family Programs currently occupies 10,500 sf of administrative space in Building 216. After they relocate to Building 3089, HQBN can relocate to Building 216. The unit requires approximately 7,000 sf of administrative office space. No future tenant or use of Building 4009 has been identified.

Renovate Pless Hall (Building 212)

Renovate Pless Hall (Building 212) as a multipurpose facility for MCB Hawaii administration (Environmental, Base Safety, Business Performance, and Human Resources), the Combat Visual Information Center (Combat Camera), a U.S. Marine Corps museum, and a MCCS food service vendor. Relocating the Environmental Department brings the department in proximity to other base administrative functions, alleviates delays associated with crossing an active airfield, and allows existing department buildings (Building 1359 and Building 1360) to support the (b) (7) (F) outside of the runway's primary surface. Combat Camera currently resides in Building 267, a facility constructed in 1944 and which is proposed for demolition to support



Figure 6-11 Base Support District Illustrative Plan

long-term warehouse redevelopment. Combat Camera could also relocate to Building 4009 after HQBN vacates to Building 216.

The renovation of Pless Hall can support a variety of uses while recapitalizing a prominent and under-utilized historic structure in the district. Issues related to the reuse of the building include lack of required AT/FP separation along Third Street, mitigation of hazardous building materials, and the lack of nearby parking to support a more intense utilization.

Expand Fitness Center

Construct a two-story, 64,000-sf addition on the existing fitness center (Building 3037, 20,320 sf, constructed in 1983). The existing facility is the main gym at MCB Hawaii Kaneohe Bay and significantly undersized for the active duty population of approximately 8,300 Marines. Based on this loading, a 97,000-sf facility is justified. The current location is ideally situated in proximity to bachelor quarters and family housing. A three-story, 330-stall parking structure accessed from the existing G Street driveway is required to meet the fitness center parking requirement (172 stalls) and replace 158 demolished BEQ parking stalls.

Develop PMO Complex

Construct a PMO complex west of the existing site to include a two-story, 31,300-sf building, 5,770-sf warehouse, and two-story, 170-stall parking structure for POV, visitor, and operational vehicles. A 50-stall paved impound lot and military working dog kennel and training area are located adjacent and to the south in the salvage yard. The facility incorporates Naval Criminal Investigative Service (NCIS) requirements. PMO operations are currently conducted out of deteriorating BEQs constructed in 1953.

Relocate MCB Hawaii Motor Transport

Relocate MCB Hawaii Motor Transport complex from the Aviation District to 2.6-ac site in the Salvage Yard. The complex includes administrative office space, a vehicle maintenance shop, a refueling vehicle shop, a vehicle holding shed, an equipment test pad, grease racks, and organizational parking. Most existing Motor Transport shops were constructed in the 1940s.

Warehouse Recapitalization

Replace aging and inefficient warehouses (Buildings 269, 270, 271, and 367) with new facilities along C Street and east of Building 250 to meet existing storage requirements, including material currently stored at Pearl City Annex.

Expand Marina Boat Storage

Construct an 85-stall boat storage facility along the eastern edge of the marina to improve and expand the existing underdeveloped boat storage yard.

Renovate Recycling Center

Renovate the existing recycling center per the MCBH Recycling Center Planning Study (2013).

Improve Transportation Networks

Realign Third Street to provide required AT/FP separation with Pless Hall (Building 212), and improve traffic flow and safety at the existing E Street intersection. Expand and connect existing pedestrian and bicycle networks, including adding sidewalks along Third and G Streets (each street currently only with facilities on one side) to provide safe access along primary roadways; develop a bike path from the main gate to G Street intersection; connect the First Street multiuse path in the Aviation District via Third Street alignment to G Street intersection; and extend Third Street sidewalk (north side) west of E Street.

Upgrade Fuel Pier

(b) (7)(F)

operations. *UFC 4-152-01, Design: Piers and Wharves* (September 2012) recommends supply piers have a minimum width of 125 ft.

Redevelop Enlisted Club Site

Redevelop enlisted club site with a multistory facility to increase density while reorienting building frontage and entryways to G Street and Third Street to promote a walkable environment along one of the installation's major roadways.

Land Reservation

The Base Support District ADP identifies 15.1 ac of land to support future base and community support infill development, including 4.4 ac identified as for a future power plant.

6.5.2 Regulating Plan

The Regulating Plan provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum and maximum building heights (number of stories) to appropriately increase development density at MCB Hawaii Kaneohe Bay. The building height guidelines intend to maximize the development potential of the installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for the Base Support District, shown on Figure 6-12, continues the existing administrative, industrial/base support, billeting, and recreational uses and identifies appropriate design characteristics and uses for infill development areas. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01, Installation Master Planning* (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)



Figure 6-12 Base Support District Regulating Plan

- Medical Building Types (medical centers and clinics)
- Commercial/Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, a bowling alley, and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.5.3 Circulation and Parking Plan

The overall goal of the Base Support District Circulation and Parking Plan is to improve vehicular flow and pedestrian safety, reduce the amount of surface parking while providing the required number of stalls, and increase walkability and bicycle riding throughout the district. Parking structures are proposed by the PMO complex and swimming pool to address existing and anticipated parking shortfall and maximize development density. A multipurpose pathway aligned south of Third Street connects the First Street pathway segment to the G Street intersection and provides direct pedestrian and bike access to the Aviation District. Sidewalks are proposed along Third and G Streets to improve pedestrian safety and mobility throughout the district.

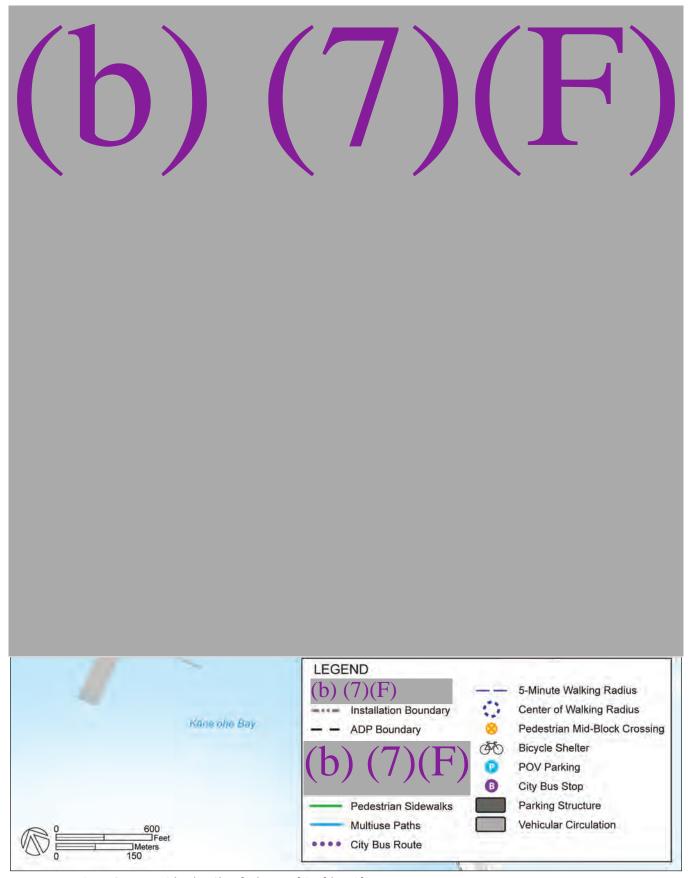


Figure 6-13 Base Support District Circulation and Parking Plan

Marine Corps Base Hawaii Installation Master Plan Base Support District Area Development Plan

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7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Base Support District ADP* presented in the context of the installation's existing CIP. Dependent actions and project phasing required for implementation are identified. The plan is presented graphically on Figure 7-1 and detailed in Table 7-1, which describes each planning action, including any required demolition or other dependent actions.

The timeframe of each planning action is classified as short-term, midterm, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions consist primarily of existing projects developed as part of the installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D. Modifications to the scope of existing projects are noted and list an updated ROM cost where appropriate.

Table 7-1 **Summary of Proposed Development Actions** (Map ID 1–6)

Map ID	Time Frame	MCB Hawaii Project#	Project Title and Description	ROM Cost (\$K)
1	Short-term FY15 EAD 9/15	P-924	MV-22 EIS Traffic Improvements Install right turn lane at Mokapu Road and Reed Road intersection 	(b) (5)
2	Short-term FY16 EAD 5/16	P-910	Bachelor Enlisted Quarters 102 room, 204 bed BEQ Supports MAG-24 unit expansion Demolish B229 and B230	
3	Short-term	N-248	Wave Attenuator and Finger Piers	
4	Short-term	P-877	(b) (7)(F)	
5	Short-term	P-875	Water Reclamation Facility Regulatory Upgrades Provides redundant treatment systemsAdds automated motor control center with SCADA system	
6	Short-term	Proposed	Reinterment Site Construct rock structure and walls Includes landscaping, sidewalks, and lighting	

Table 7-1 **Summary of Proposed Development Actions** (Map ID 7–17)

Table 7 1 Sal	illiary or reposi	ca bevelopine.	me Actions (Map 15 / 17)	
Map ID	Time Frame	MCB Hawaii Project#	Project Title and Description	ROM Cost (\$K)
7	Short-term	Proposed	Medical Clinic Conversion for MCCS and IPAC Convert medical clinic to support new tenants Demolish B1043	(b) (5)
8	Short-term	P-935	(b) (7)(F)	
9	Mid-term	P-930	 Fire Station New station on existing site Existing facility undersized approximately 17,000-sf MCCS dance studio rebuilt in Community Support District 	
10	Mid-term	P-943	(b) (3) (A) , (b) $(7)(F)$	
11	Mid-term	P-881		
12	Mid-term	Proposed	 Fitness Center Expansion Construct new 64,000-sf two-story addition Construct 330-stall three-story parking structure 	
13	Mid-term	P-911	Bachelor Enlisted Quarters 102 room, 204-bed BEQ Includes parking structure Demolish B227 and B228	
14	Mid-term	P-912	Bachelor Enlisted Quarters 102 room, 204-bed BEQ	
15	Mid-term	Proposed	Third Street Realignment Creates required AT/FP setbacks for Pless Hall (B212) reuse Improves traffic flow and safety Multiuse path from First Street to G Street	
16	Mid-term	Proposed	Pless Hall (B212) Renovation • Multipurpose facility • Reuse of historic building • Demolish B272 and B279	
17	Mid-term	Proposed	(b) (7)(F)	

Table 7-1 **Summary of Proposed Development Actions** (Map ID 18–25)

Map ID	Time Frame	MCB Hawaii Project #	Project Title and Description	ROM Cost (\$K)
18	Long-term	Proposed	 PMO Complex Construct 31,300-sf two-story administration building and 180-stall two-story parking structure Construct 5,770-sf storage shed Relocate military working dogs kennel and training area Pave 50-stall impound lot Demolish B1095, B1096, B1126 and B5090 	(b) (5
19	Long-term	Proposed	Base Motor Transport Complex Construct new complex in salvage yard Demolish 16 facilities 5.6-ac infill site in Aviation District	
20	Long-term	Proposed	Boat Storage Expand and improve boat storage yard east of marina 100 total stalls	-
21	Long-term	Proposed	Recycling Center Renovation Based on 2013 planning study Demolish storage tank B125	
22	Long-term	Proposed	Warehouse District Retain and renovate B250 Construct two 27,500-sf warehouses Construct 37,500-sf warehouse Demolish B266, B269, B270, B271, B277, B367, and B3096	
23	Long-term	Proposed	 Enlisted Club Site Redevelopment Underutilized but prominent commercial site Construct 68,000-sf two-story structure Demolish B1629 	
24	Long-term	Proposed	(b) (7)(F)	
25	Long-term	Proposed	Recreation and Pedestrian Improvements Construct two new basketball courts, BBQ pavilion and bicycle shed GStreet multiuse path Demolish roller rink	

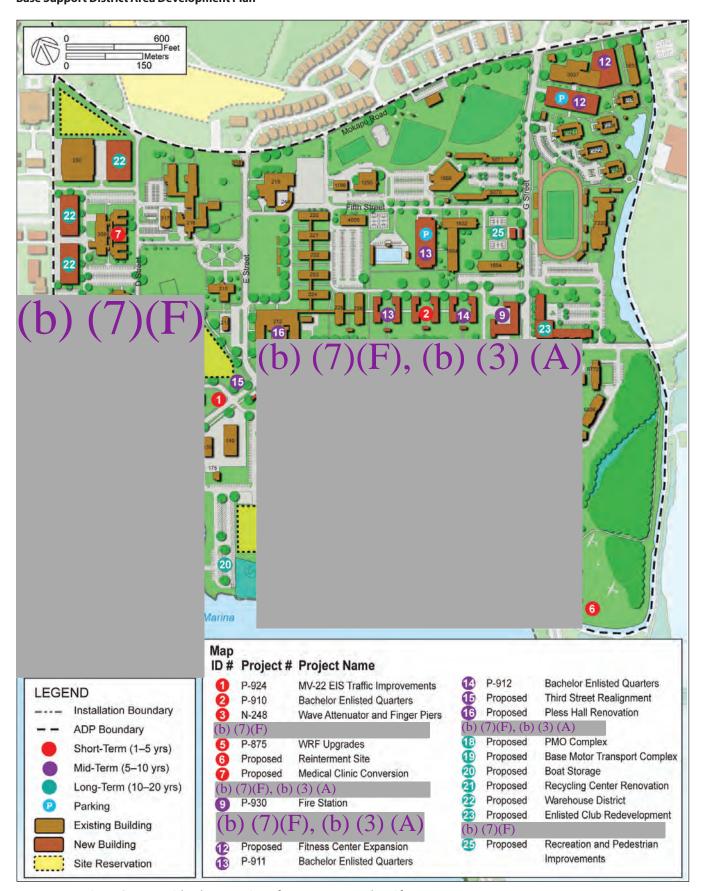


Figure 7-1 Base Support District Area Development Execution Plan

7.2 Demolition Plan

Figure 7-2 highlights facilities proposed for demolition in the Base Support District. These facilities have either exceeded their economic life and require replacement, are excess and no longer need to meet space requirements, or need to be relocated to support other development actions. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition** (Facilities 125–6502)

*[Denotes a facility encumbered by an existing
١	IAVFAC Energy Savings Performance Contract
(ESPC). ESPC contract encumbrance continues
U	ıntil September 2030. Contract termination costs
S	hould be considered during project programming.

FACILITY NUMBER	FACILITY USE	AREA (SF)	FACILITY AGE	YEAR BUILT
125	Fuel Storage Tank	2,555	76	1940
146	Comm Storage	5,376	72	1944
227	Bachelor Enlisted Quarters*	15,928	75	1941
228	Bachelor Enlisted Quarters*	15,928	75	1941
229	Bachelor Enlisted Quarters*	15,928	75	1941
230	Bachelor Enlisted Quarters*	15,928	75	1941
(b) (7)(F)			
267	Combat Visual Information Center*	16,256	72	1944
269	Warehouse*	13,835	72	1944
270	Warehouse*	9,600	72	1944
271	Warehouse*	15,268	72	1944
272	Civilian Personnel Office*	5,160	72	1944
279	Joint Safety Center/MCCS SACC*	20,706	62	1954
367	MCCS Warehouse	5,380	72	1944
476	Base Safety Storage	160	73	1943
1094	Vacant	20,830	63	1953
1095	PMO Office/Classroom*	23,135	63	1953
1096	PMO Station*	21,365	63	1953
(b) (7))(F)			
1583	Warehouse/Dance Gym*	6,560	54	1962
1629	Enlisted Club*	32,256	42	1974
1636	Sentry House	30	41	1975
3096	Classroom*	1,000	31	1985
4074	Fire Station*	6,154	29	1987
5090	Military Working Dog Kennel	2,697	27	1989
6078	3d Marines Storage*	1,920	24	1992
6502	Salvage Yard Storage	980	17	1999

Table 7-2 **Summary of Proposed Demolition** (Facilities 6704–6862C3)

FACILITY NUMBER	FACILITY USE	AREA (SF)	FACILITY AGE	YEAR BUILT
6704	EMS Facility	1,070	9	2007
6714C3	PMO 1st Responder Equipment Shed	2,400		
6862C3	PMO CAMMS Shelter	1,128		

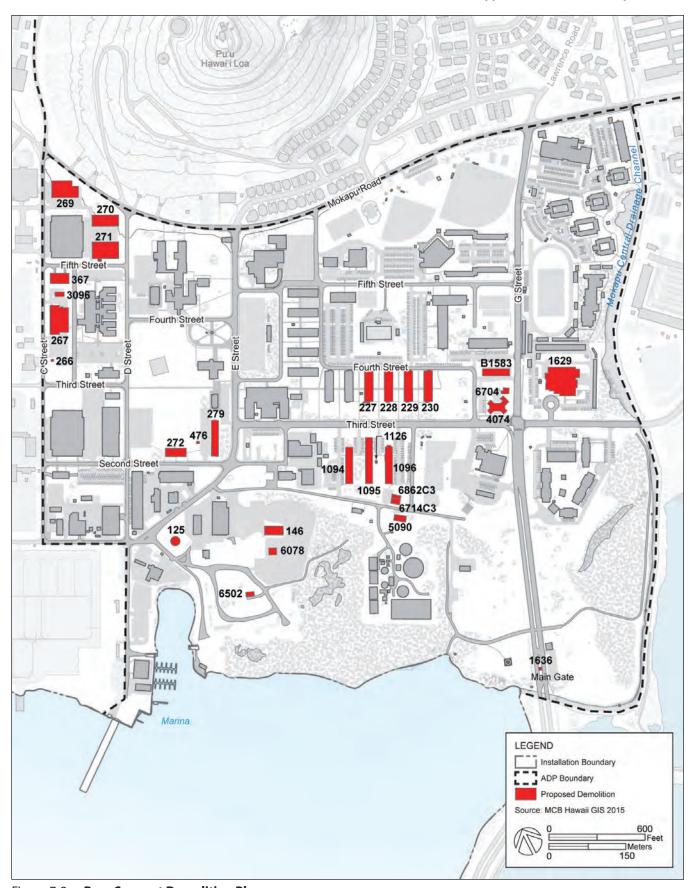


Figure 7-2 Base Support Demolition Plan

Marine Corps Base Hawaii Installation Master Plan Base Support District Area Development Plan

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Acronyms and Abbreviations

AAV	Assault Amphibious Vehicle	EIS	Environmental Impact Statement
ADP	Area Development Plan	ESC	Engineering Service Company
III MEF	III Marine Expeditionary Force	ESPC	Energy Savings Performance Contract
1/12	1st Battaltion/12th Marines	ESQD	Explosive Safety Quantity Distance
AC	Acre	FT	Feet
ADP	Area Development Plan	FY	Fiscal Year
AT/FP	Antiterrorism/Force Protection	GIS	Geographic Information System
BEQ	Bachelor Enlisted Quarters	H&S	Headquarters & Service
BFR	Basic Facility Requirement	HECO	Hawaiian Electric Company
BN	Battalion	HMLA	Marine Light Attack Helicopter
BWS	Board of Water Supply		Squadron
CAC	Combat Assault Company	HMMWV	High Mobility Multipurpose Wheeled Vehicle
CCD	Construction Completion Date	HSM	Helicopter Maritime Strike Squadron
CCN	Category Code Number	HQ	Headquarters
CDET	College of Distance Education and Training	ICRMP	Integrated Cultural Resources Management Plan
CIP	Capital Improvement Plan	IMP	Installation Master Plan
CISD	Communications Information Systems Directorate	IN	Inch
CLB	Combat Logistics Battalion	INRMP	Integrated Natural Resources Management Plan
CLC	Combat Logistics Company	IPAC	Installation Personnel
CMC	Commandants of the Marine Corps		Administration Center
СР	Command Post	IRP	Installation Restoration Program
CPRW	Commander, Patrol and	kV	Kilovolt
DEEDC	Reconnaissance Wing	LOGCOM	Marine Corps Logistics Command
DEERS	Defense Enrollment Eligibility Reporting System	MAG	Marine Aircraft Group
DoD	Department of Defense	MAGTF	Marine Air Ground Task Force
EA	Each	MARFORPAC	U.S. Marine Corps Forces Pacific
EA	Environmental Assessment	MCAS	Marine Corps Air Station
EAD	Estimated Award Date	MCB Hawaii	Marine Corps Base Hawaii
ECP	Entry Control Point	MCCS	Marine Corps Community Services

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MCO Marine Corps Order **UDP** Unit Deployment Program

Marine Corps Training Area Bellows UFC Unified Facilities Criteria **MCTAB**

MCX Marine Corps Exchange UM Unit of Measure

MILCON Military Construction USA **Utility System Assessment**

MSL Mean Sea Level **USPACOM** U.S. Pacific Command

VMU Marine Unmanned Aerial Vehicle MVA Megavolt Ampere

Squadron

Wounded Warrior Battalion

VR Navy Reserve Squadron NAF Non-appropriated Funds

WMA Wildlife Management Area NAS **Naval Air Station**

WRF Water Reclamation Facility **NAVFAC PAC Naval Facilities Engineering Command**

> Pacific **WWBN**

NRHP National Register of Historic Places

Marine Wing Support Detachment

Pearl City Annex

Provost Marshal's Office **PMO**

PΝ Personnel

MWSD

PCA

POV Privately-Owned Vehicle

PPV **Public-Private Venture**

PSI Pounds per Square Inch

PV Photovoltaic

PVA Project Valuation Assessment

RTF Range Training Facility

Rough Order of Magnitude **ROM**

SAIA Sikes Act Improvements Amendments

SCIF Sensitive Compartmented Information

Facility

SF Square Feet

SOCPAC Special Operations Command Pacific

SOI School of Infantry

SY Square Yard

TECOM Marine Corps Training and Education

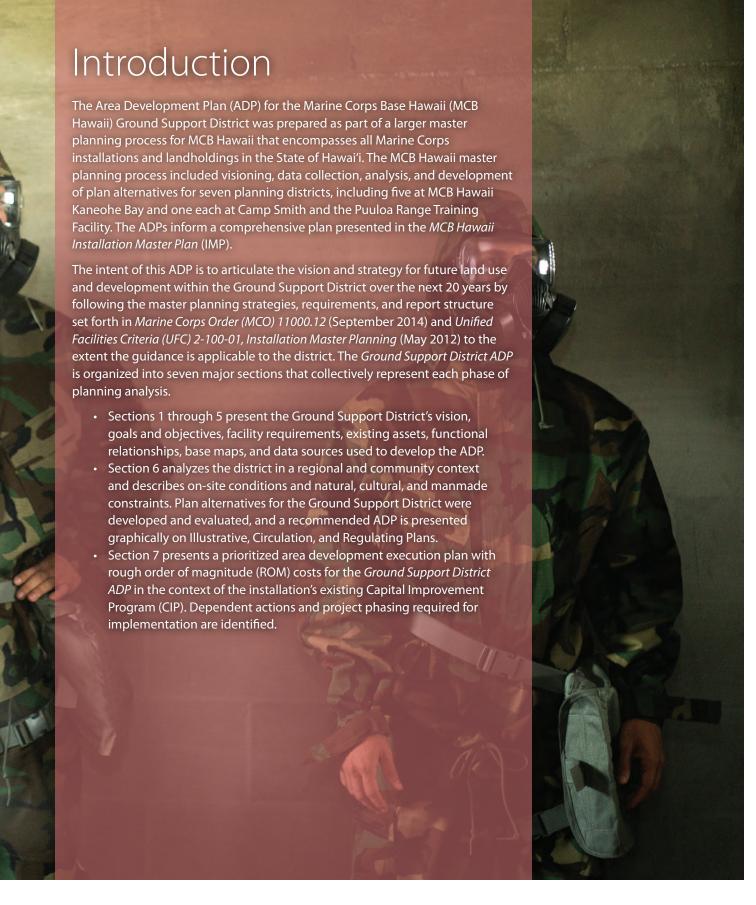
Command

TSF **Training Support Facility**

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1 Vision, Goals, and Objectives

1.1 Background

The Ground Support District is located on the south-eastern portion of Mökapu Peninsula at MCB Hawaii Kaneohe Bay as shown on Figure 1-1. The district is bounded by the Mokapu Central Drainage Channel on the west, Kailua Bay on the east, Mokapu Road on the north, and the Aikahi Park subdivision of Kailua on the south. The majority of facilities in the Ground Support District directly support Marine Corps ground and logistics unit operations and training. Direct support functions include headquarters administration, vehicle and heavy equipment maintenance and storage, weapon maintenance and storage, training, logistics and supply, garrison aid stations, bachelor enlisted quarters (BEQ) and other support facilities. The Boondocker Training Area, a training auditorium, and some Marine Corps Community Service (MCCS) retail shops are also located within the district. Over half of the land area in the district is wetland and designated as the Nu'upia Ponds Wildlife Management Area (WMA).

The Ground Support District shares the installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.2 Ground Support District

The Ground Support District has its own vision, goals, and objectives that take into consideration the district's unique mission, functions, location, and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable. The planning goals and objectives were developed during the visioning workshop and subsequently refined at the planning charrette and concept workshop.

District Mission

To provide administrative, medical, training, supply, and maintenance services to ground units in order to enable ready and deployable forces in support of real world operations, contingencies, and theatre security cooperation

District Vision

To create an environment that promotes unit cohesion and space efficiency. Marines will be housed near their work areas in facilities that promote walkability and consolidate unit functions onto contiguous real estate. The district will utilize mixed vertical and horizontal development to combine common functions into single building and maximize open greenspace for basic field training and physical fitness

The planning goals of the Ground Support District include the following.

- Preserve and expand training assets: Ensure there is no net loss of training facilities or open spaces used for unit formations and maneuver training.
- Replace aging infrastructure: Many of the buildings in the district were
 constructed in the early 1950s and are deteriorating, were not designed
 for current uses, and should be replaced. Underutilized facilities should
 be vacated and demolished to reduce ongoing maintenance costs and
 provide space for future development, as appropriate.
- Increase development density: To maximize use of the limited, available
 land in the district, dense, compact vertical redevelopment with limited
 surface parking should be pursued.
- Improve land use to create future development opportunities:
 Functions that do not directly support ground unit and supply operations and can operate just as efficiently from another location should be relocated to support future ground-related unit expansion.
- **Unit Consolidation:** Consolidate ground and logistics unit functions into modern and efficient buildings organized in enclaves to improve operational efficiency and unit cohesion.

Specific planning objectives of the Ground Support District include the following.

- Consolidate ground unit Headquarters south of Mokapu Road around a parade ground
- Ensure no net loss of open field training space
- Expand Combat Assault Company (CAC) compound
- Construct permanent 3d Marine vehicle shelters
- Construct district parking structures
- Redevelop the 1600-series BEQs
- Relocate and expand Combat Logistics Battalion 3 (CLB-3) armory to meet requirement
- Redevelop aging warehouses with modern and efficient facilities and provide additional space to incorporate storage requirements currently met at Pearl City Annex (PCA)
- Relocate Engineering Services Company compound
- Identify space for redevelopment and operational expansion



Figure 1-1 **District Location**



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2 Facility Requirements and Land

This section of the plan establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Ground Support District ADP* is based.

2.1 Area Force Loading

2.1.1 MCB Hawaii Kaneohe Bay

Estimated personnel loading data for FY18 indicate MCB Hawaii Kaneohe Bay will have a total population just over 18,000, as shown in Table 2-1. This loading includes the arrival of two MV-22B squadrons, the departure of three Navy P-3 squadrons, and the arrival of a rotational Navy P-8 detachment. This population is spread throughout the base districts.

Table 2-1 Projected FY18 Force Loading for MCB Hawaii Kaneohe Bay

OFFICER ¹	ENLISTED ¹	CIVILIAN1	DEPENDENT ²	TOTAL
746	7,288	682	9,871	18,587

¹ Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY12 Facilities Support Requirements document, FY12 Navy Manpower Report, and FY18 projected Tables of Organization. Unit Deployed Program (UDP) personnel have been subtracted from these numbers.

2.1.2 Ground Support District

Population within this district is primarily comprised of subordinate units of the 3d Marine Regiment, which has both unit headquarters and billeting in the district. These include three infantry battalions (1/3, 2/3, and 3/3), one of which is rotationally deployed at a time, an artillery battalion (1st Battalion, 12th Marines, also referred to as 1/12), and a CAC. CLB-3, Combat Logistics Company 35 (CLC-35), and 3rd Radio Battalion are also located and billeted within this district. There are 21 BEQ totaling 2,257 bed spaces, a mess hall (Anderson Hall), and unit garrison aid stations to support unit billeting.

Population loading for the Ground Support District is estimated as follows.

- 3d Marine Regiment and subordinate units, approximately 4,000 total military
- Logistics Combat Element units, approximately 810 total military
- · 3d Radio Battalion, approximately 441 total military

2.2 Area Equipment Loading

Estimated equipment loading data was extracted from BFR documents for FY 2018. Subordinate units of the 3d Marine Regiment, the 3d Radio Battalion, and CLB-3 have significant numbers of large and heavy rolling stock, as listed in Table 2-2. This equipment is primarily parked within this district.

² Dependent personnel numbers have been derived using December 2012 Defense Manpower Data Center reports. Includes UDP personnel and their dependents.

Table 2-2 **3d Marine Regiment, Combat Logistics Battalion 3, and 3d Radio Battalion Major Equipment (Rolling Stock) Loading**

UNIT	EQUIPMENT TYPE	NUMBER
3d Regiment, HQ Company		(b) $(7)(F)$
Battalion H&S Company	Rolling stock, utility and 7-ton trucks, HMMWV,	
Battalion H&S Company	ambulance, wreckers, water tank trailers, fork lifts, and	
Combat Assault Company	amphibious assault vehicles, ammunition trailers, heavy	
1st Battalion, 12th Regiment	cargo trailers	
3d Radio Battalion		
CLB-3	Rolling stock, utility and cargo trucks, wreckers, water tank trailers, armored dump trucks, 7-ton trailers	

2.3 Facility Requirements

Basic facility requirements for the Ground Support District were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies are presented in Table 2-3.

Table 2-3 **Ground Support District Facility Requirements** (CCN 13115–CCN 21451)

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
13115	(b) (7)(F)				
14311	Operational Vehicle Garage	SF	8,280	0	(8,280)
14345	(b) $(7)(F)$				
14377	Operational Storage	SF	7,400	6,403	(997)
14378	(b) $(7)(F)$				
17110	Academic Instruction Building	SF	2,297	2,246	(51)
17120	Applied Instruction Building	SF	3,200	3,000	(200)
17135	Operational Trainer Facility	SF	50,862	17,308	(33,554)
17330	Covered Training Area	SF	5,744	5,744	0
17917	Rappelling Training Area	EA	2	2	0
17991	Confidence Course	EA	1	1	0
17992	Obstacle Course	EA	0	1	1
21343	Sheet Metal Shop	SF	5,300	9,047	3,747
21373	Landing Craft Wash Rack	EA	1	2	1
21375	Amphibian Vehicle Maintenance Shop	SF	11,700	7,494	(4,206)
21451	Automotive Organizational Shop	SF	88,864	102,362	13,498

Table 2-3 **Ground Support District Facility Requirements** (CCN 21453–CCN 85310)

(CCN 21455-CCN 65510)						
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)	
21453	Field Maintenance Shop	SF	9,000	13,485	4,485	
21455	Vehicle Wash Platform	EA	18	4	(14)	
21456	Grease Rack	EA	4	3	1	
21510	Small Arms Shop	SF	100	2,411	2,311	
21530	(b) $(7)(F)$					
21560	Field Maintenance Shop (Ordnance)	SF	950	1,663	713	
21710	(b) (7)(F)					
21730	,	SF	6,700	6,546	(154)	
21777	(b) (7)(F)					
21820	Construction/Weight Handling Equipment Shop	SF	13,600	11,729	(1,871)	
21880	Field Maintenance Shop	SF	5,325	1,812	(3,513)	
43110	Cold Storage Warehouse	SF	60	0	(60)	
44112	Storage of Air or Ground Organic Units for Marine Corps	SF	67,360	151,282	83,922	
45110	Open Storage Area	SY	3,727	0	(3,727)	
61071	Regimental Group Headquarters— CMC Only	SF	14,800	16,391	1,591	
61072	Battalion Squadron Headquarters— CMC Only	SF	67,000	61,737	(5,263)	
61073	Company Battalion Headquarters— CMC Only	SF	70,575	77,611	7,036	
61074	Garrison Aid Station, Marine Corps	SF	32,082	28,772	(3,310)	
72147	Unaccompanied Housing for Wounded Warriors	SF	26,461	9,910	(16,551)	
72210	Enlisted Dining Facility	PN	4,204	3,060	(1,144)	
74003	Exchange Central Admission	SF	7,828	9,987	2,159	
74045	Fitness Room	SF	0	10,661	10,661	
74085	Exchange Distribution Center (Warehouse)	SF	29,330	32,636	3,306	
85210	Parking Area	SY	66,675	0	(66,675)	
85310	Parking Building	SF	0	72,401	72,401	

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

2.4 Developable Real Estate

During the planning process, areas throughout the 750-ac Ground Support District were assessed for their ability to accommodate future development or redevelopment, and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- Potentially Developable: Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Areas identified as Developable with Constraints include sites where existing facilities are outdated, in poor physical condition, or poorly sited. These sites provide opportunity for infill development. Infill development is the process of developing vacant or under-used parcels within areas that are already largely developed, and results in more compact development patterns, minimizes the need for new infrastructure (and may lower development costs due to proximity to existing infrastructure), and ensures that housing, work areas, and support services are close to one another. This approach supports MCB Hawaii's stated goals to create modern, efficient, and sustainable facilities and to consolidate functions. It also supports the goal of preserving land for training or recreational areas such as parks and greenspace. The potential availability of areas in the Ground Support District for future development is shown on Figure 2-1.

2.5 District Assets

Developed areas of the Ground Support District contain headquarters for Marine Corps infantry, artillery, assault amphibious vehicles (AAV), radio and logistic support units, organic unit storage, warehouses, maintenance shops, BEQs, the mess hall, and armories. A large Marine Corps Exchange (MCX) annex is centrally situated within this district at Building 1090. Undeveloped areas directly northeast of the ponds are used for training. The Boondocker Training Area contains a confidence course, an obstacle course, a rappel/fast-rope tower, a leadership reaction course, a tactical landing zone, a warrior pit, and a gas chamber.

A large portion of the district is covered by the 517-ac Nu'upia Ponds WMA, which consists of eight interconnected ponds, wetlands, and shrubland. Development within this protected area is prohibited, and it serves as a natural buffer between the adjacent civilian communities. The ponds are used annually by the CAC for AAV training, which has an added benefit of churning the pickleweed that chokes

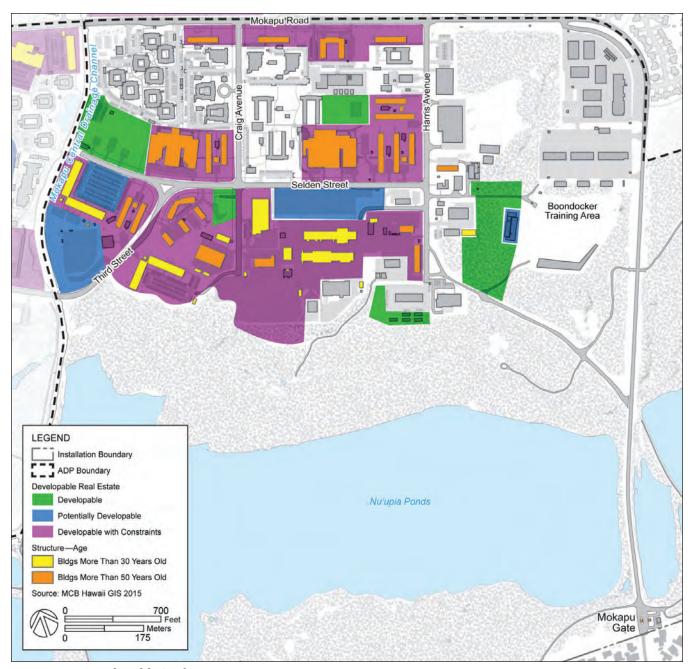


Figure 2-1 **Developable Real Estate**

the mud flats and opening up nesting ground for the federal-listed endangered Hawaiian stilts that inhabit the area.

Major facilities and other landmarks are illustrated on the Ground Support District Base Map (Figure 4-3) in Section 4.0, Base Maps.

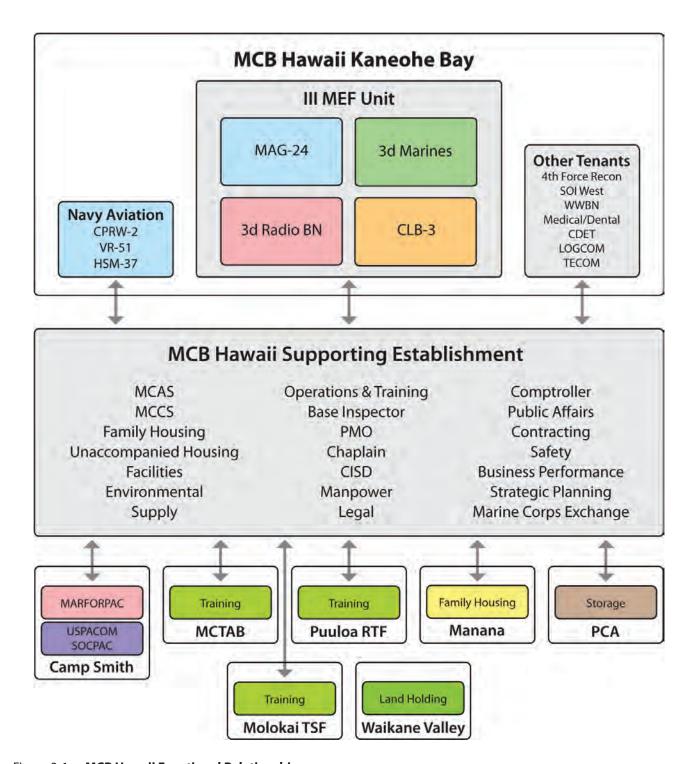


Figure 3-1 MCB Hawaii Functional Relationships

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii installations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawaii MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal Command Element functions/units do reside at various locations.

Following sections provide details pertaining to specific land uses and functional relationships within the Ground Support District.

3.2 **Ground Support District**

Figure 3-2 illustrates the functional relationships between major tenants and land uses within the Ground Support District, which contains ground unit headquarters (e.g., infantry battalions, AAV company, and artillery battery), unit organizational parking and maintenance facilities, mess facilities, billeting, training areas, and two armories. Other ground support-related uses and functions include a medical aid station and MCCS retail and recreational facilities. Facilities that do not have a direct or related link to this district's main purpose should be considered for relocation to suitable districts, if economically feasible.

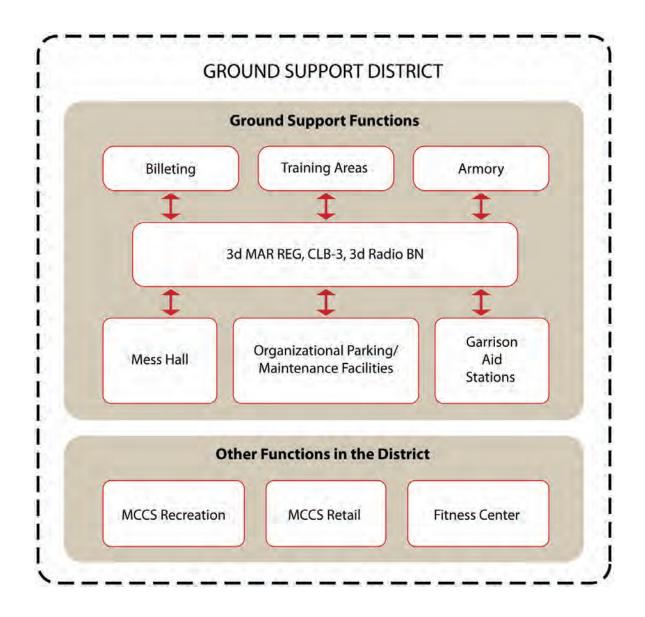


Figure 3-2 **Ground Support District Functional Relationships**

4 Base Maps

Section 4 shows the Ground Support District in the context of the neighboring Windward O'ahu community (Figure 4-1) and in relation to the other areas of MCB Hawaii Kaneohe Bay (Figure 4-2). Figure 4-3 highlights the major facilities and the physical geography of the district.

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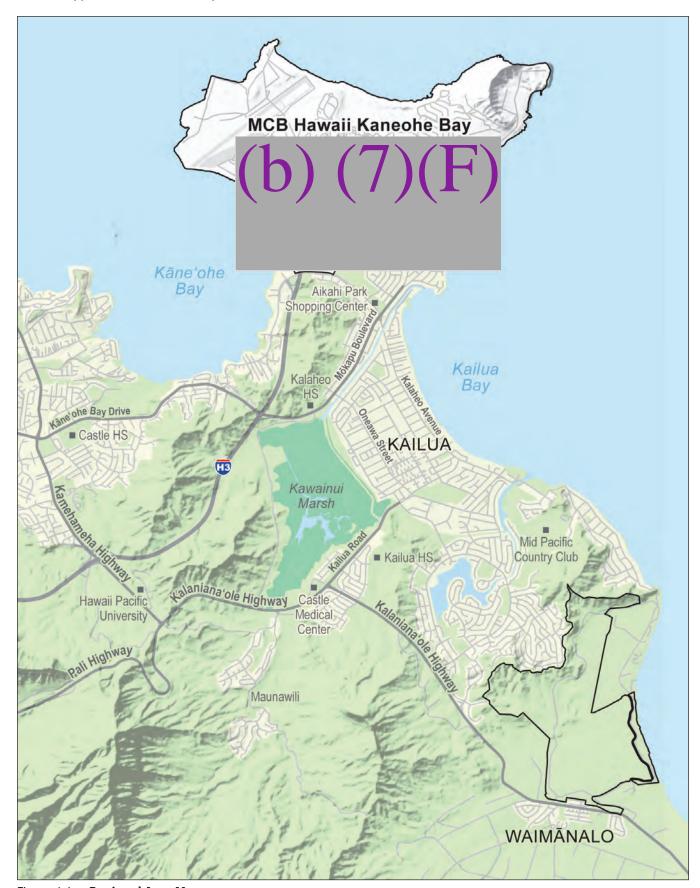


Figure 4-1 Regional Area Map

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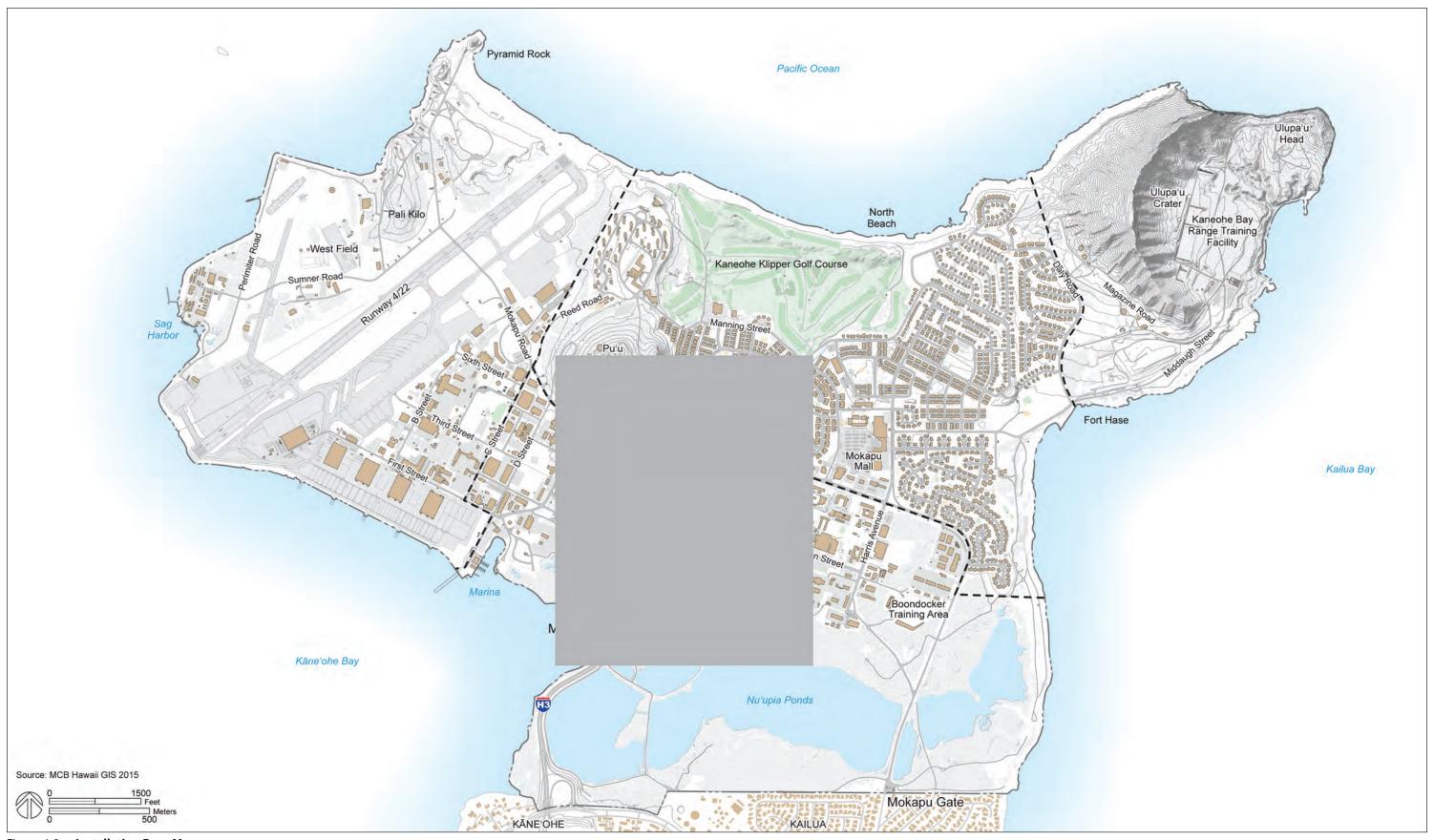


Figure 4-2 **Installation Base Map**

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Marine Corps Base Hawaii Installation Master Plan Ground Support District Area Development Plan

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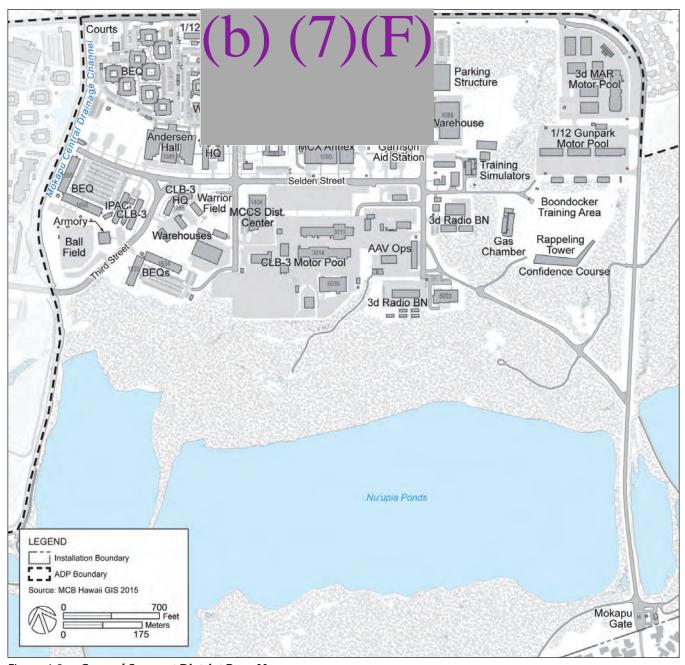


Figure 4-3 Ground Support District Base Map

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Marine Corps Base Hawaii Installation Master Plan

Ground Support District Area Development Plan

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5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and geographic information system (GIS) and facility databases were all primary information sources contributing to the development of the *Ground Support District ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating in the district. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

U.S. Marine Corps. Marine Aviation Plan 2015.

This plan was prepared under the authority of Marine Corps Deputy Commandant for Aviation and covers the topics of the Marine Corps Operational Landscape, Expeditionary Aviation Program and Concepts, and the Marine Aviation Organization and Enterprise. A *Marine Aviation Almanac* is also provided.

Marine Corps Base Hawaii. Marine Corps Base Hawaii Kaneohe Bay Parking Study, Final Report. Prepared by Belt Collins Hawaii, Weslin Consulting. August 2014.

The parking study analyzed the base's parking assets and requirements, and identified areas with parking surpluses and deficits. Strategies were developed to provide for the growing demand for parking.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities, and other planning documents and metrics.

Ground Support District stakeholders included representatives from the following units and departments.

MCB Hawaii Leadership & Administration

Marine Forces Pacific

Marine Corps Installation Command

3d Marine Regiment

1st Battalion, 12th Marine Regiment

Combat Logistic Battalion 3

3d Radio Battalion

Wounded Warrior Battalion

Navy Health Clinic Hawaii

21st Dental Company

Provost Marshall's Office

Operations & Training Department

Unaccompanied Personnel Housing Department

Facilities Department

Public Works Department

Communications Information
Systems Directorate

Environmental Department

Energy Department

Marine Corps Community
Services

Naval Facilities Engineering
Command Pacific

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U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee Planners. December 2013.

The Optimization Study was prepared in response to an ongoing Department of Defense (DoD) process to evaluate the realignment of forces in the Pacific Region. The study identifies development opportunities that may be used to satisfy long-term requirements associated with relocation of units from Okinawa under the Defense Policy Review Initiative.

Commanding General, Marine Corps Forces Pacific, Commanding Officer, Marine Corps Base Hawaii and Naval Facilities Engineering Command. United States Marine Corps Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study. March 2014.

This purpose of this study is to provide recommendations for the Marine Corps to prioritize and pursue in order to sustain future MAGTF training in the Hawaiian Islands. The study identifies Marine Corps training requirements, identifies gaps in capabilities, and develops recommendations for all potential future training sites.

Marine Corps Base Hawaii. Base Exterior Architectural Plan. Draft. December 2013.

The Base Exterior Architectural Plan presents both recommendations and guidelines to establish proper and consistent visual design of buildings and sites at MCB Hawaii Kaneohe Bay. The document analyzes existing base conditions and presents requirements and guidelines on site planning, landscape design, roadway design, architecture, and signage.

Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Utility System Capacity Study, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared by Helber Hastert & Fee Planners and HDR Engineering, Inc. October 2013.

The primary objective of this study was to determine the overall impacts of proposed military construction (MILCON) and non-appropriated funds (NAF) projects in the flight line area on water and wastewater systems. The evaluation area was limited to the area bounded by "D" Street, Reed Road, and the west boundary of the flight line area along Sumner Road and Perimeter Road. The study recommended water and wastewater improvement projects to upgrade and correct service deficiencies at the flight line.

Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. May 2013.

This environmental assessment (EA), prepared in accordance with the National Environmental Policy Act, evaluates a proposal to provide suitable sites on DoD installations in Hawai'i to a private entity for the installation and operation of photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on DoD installations on O'ahu and Kaua'i.

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Marine Corps Base Hawaii and Naval Facilities Engineering Command, Hawaii Division. Bicycle Route Planning Study for Marine Corps Base Hawaii Kaneohe Bay. Prepared by Belt Collins Hawaii LLC et al. December

2012. MCB Hawaii Kaneohe Bay seeks to encourage alternative modes of transportation within the base, particularly bicycling. This study included an extensive user survey, and identified and evaluated four alternative approaches to implementing a bikeway system to meet user demands and encourage ridership. The recommended alternative proposes a bikeway system using bike routes, bike lanes, bike paths, and shared use paths.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Pacific Division. *Final Marine Corps Base Hawaii Warehouse Study*. Prepared by Belt Collins Hawaii LLC. June 2012.

The purpose of this study was to evaluate existing warehouse and supply conditions at MCB Hawaii. The study found that warehouse facilities are not optimized for space usage, primarily due to "stovepipe" management, where each unit has direct control of material needs. This results in operational effectiveness, but also unnecessary laydown space. Additional storage requirements were projected. To correct existing inefficiencies, the plan proposes to utilize modern technologies, optimize existing facilities, consolidate like users, and construct a new warehouse.

Department of the Navy. Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i. Volumes I and II. June 2012.

This environmental impact statement assessed potential environmental impacts associated with the proposed basing of MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. The introduction of these aircraft in Hawai'i is part of the Marine Corps' plan to restructure and rebase its forces in the Pacific over the next 10 years.

Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

This plan provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

NAVFAC Pacific. Traffic Impact Report for the Marine Aviation Plan to Locate MV-22 and HMLA Squadrons at MCB Hawaii Kaneohe Bay, Kaneohe, Hawaii. Prepared by Julian Ng, Inc. September 2011.

This report looked at the traffic impacts of locating MV-22 and HMLA squadrons at MCB Hawaii Kaneohe Bay, which will increase the number of personnel on

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Section 5 | Data Collection

base. Recommendations for roadway improvements were identified to address existing and future traffic conditions, which are expected to be increasingly undesirable.

Department of the Navy, NAVFAC Pacific. Feasibility Study for Reuse of Former Quarry Pit Landfill, MCB Hawaii Kaneohe. Prepared by Fukunaga and Associates. April 2011.

This report presents the results of a feasibility study for the potential reuse of the former Quarry Pit Landfill site located adjacent to Building 4088 at MCB Hawaii Kaneohe Bay. The site was originally used as a quarry pit during construction of Fort Hase and the Naval Air Station, Kaneohe Bay in the 1940s. The study determined the extent and composition of the former landfill, evaluated its geotechnical and environmental conditions, and provided planning level cost estimates for various types of uses, including park, play fields, temporary housing and warehouses.

Naval Facilities Engineering Command (NAVFAC) Pacific. Electrical Utility System Assessment (USA) MCB Hawaii, Kaneohe, Hawaii. March 2011. The purpose of this Electrical Utility System Assessment was to review the power requirements of future MILCON projects, and assess their impact on MCB Hawaii Kaneohe Bay primary electrical distribution system. The entire system was surveyed, and existing capacity, condition, and reliability were assessed.

U.S. Marine Corps Community Services. Project Validation Assessment: Final Report, Wiki Wiki Marine Mart. Prepared by ICF International. March 2010.

This study is a Project Validation Assessment (PVA) for the proposed construction of a new Marine Mart at MCB Hawaii, to replace the existing Wiki Wiki Marine Mart. The PVA included a market analysis, site analysis, and financial analysis. Three options, including a no build option, were evaluated. The recommendation is a Modified Installation Proposed Option, a new 10,560 sf Wiki Wiki Marine Mart at the intersection of Selden Street and Craig Avenue.

Naval Facilities Engineering Command, Pacific. Security Gate Improvements at Marine Corps Base Hawaii Kaneohe Bay. Prepared by Belt Collins Hawaii Ltd. April 2007.



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Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

This master plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

Hawaii Pacific Engineers. Mokapu Central Drainage Channel Study, Marine Corps Base Hawaii, Kaneohe Bay. Prepared by Hawaii Pacific Engineers. February 2002, revised March 2003. This study is an assessment and refinement of a 1995 study of the Mokapu Central Drainage Channel, located in the central area at MCB Hawaii Kaneohe Bay. The channel conveys stormwater runoff in a north to south direction from the Kaneohe Klipper Golf Course through the base before discharging into Kāne'ohe Bay near the Nu'upia Ponds. Refinements included development of more accurate topographic data for the channel; developing channel flow rates at more frequent intervals corresponding to locations of actual inputs; and a hydraulic analysis at more frequent intervals along the channel, using the updated topographic and channel flow data. Based on the hydraulic analysis, recommendations were made for prioritizing drainage system improvements and estimated budgetary construction costs were provided.

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Marine Corps Base Hawaii Installation Master Plan Ground Support District Area Development Plan

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6 ADP Area Analysis

Section 6, ADP Area Analysis, presents the regional, offsite, and onsite conditions related to the Ground Support District. Section 6.1 Regional Context, describes the neighboring civilian community. Section 6.2, Offsite Conditions, describes the general physical characteristics of MCB Hawaii Kaneohe Bay. Section 6.3, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resource constraints within the Ground Support District. Plan alternatives for the Ground Support District were developed and evaluated, and a recommended Area Development Plan is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Ground Support District is located within the boundaries of MCB Hawaii Kaneohe Bay, located on Mōkapu Peninsula on the windward side of Oʻahu. Mōkapu Peninsula is bordered by Kāneʻohe Bay on the west, Kailua Bay to the east, and the Pacific Ocean to the north. On its south side, MCB Hawaii Kaneohe Bay abuts civilian lands, including a residential neighborhood of Kailua town, a City and County of Honolulu wastewater treatment plant, and portions of Kāneʻohe town. The combined population of the Kāneʻohe/Kailua region is approximately 82,750 residents, with approximately 44,100 residing in Kāneʻohe and 38,650 residing in Kailua (U.S. Census 2010). Both Kailua and Kāneʻohe are primarily residential bedroom communities that include regional commercial, civil, and medical services.

Windward Oʻahu is separated from the more densely populated and urbanized city of Honolulu by the Koʻolau mountain range. Access to MCB Hawaii Kaneohe Bay from Honolulu is available via three highways that tunnel through the Koʻolau mountain range—the Likelike Highway 63, Pali Highway 61, and the John A. Burns H-3 Freeway. Oahu Transit Services provides county bus service to MCB Hawaii Kaneohe Bay. Regular off-base service is provided by Route 56 with multiple stops located within walking distance of the main and Mokapu gates. On-base service is provided by Route 70 five times daily between 0750 and 1400.

See Section 4, Figure 4-1, Regional Area Map, for a map showing the Ground Support District in the context of windward O'ahu.

6.2 Offsite Conditions

This section describes the general physical characteristics of the entire MCB Hawaii Kaneohe Bay installation.

6.2.1 Geology

The Mōkapu Peninsula was formed by basaltic lava eruptions from four separate volcanic vents during the last period of volcanic activity on O'ahu. Major volcanic features of the peninsula include Kū'au or Pyramid Rock on the northwestern tip of the installation, Pu'u Hawai'i Loa in the central area, and Ulupa'u Crater on the northeastern tip.

Following this volcanic activity, the peninsula was inundated by a rise in sea level, during which time an extensive coral reef was formed. As sea level retreated to its present level, beaches and sand dunes were formed from the deposition of calcareous sand by the prevailing tradewinds. Approximately 280 ac of coral fill were added to the peninsula's marshy central drainage basin between 1939 and 1941 to both deepen the sea channel for marine vessels and create a runway (Department of the Navy 2006).

6.2.2 Topography

Topography at MCB Hawaii Kaneohe Bay generally slopes toward the Nu'upia Ponds, with coastal areas sloping toward the shores. The three volcanic highpoints, Pyramid Rock, Pu'u Hawai'i Loa, and Ulupa'u Crater, are at elevations of approximately 75 ft, 330 ft, and 665 ft above mean sea level (msl), respectively.

6.2.3 Hydrology

The Mokapu Central Drainage Channel is a lined stream channel that runs through much of the base and empties into the Nu'upia Ponds WMA and ultimately into Kāne'ohe Bay. Several watershed improvement projects have been conducted over the years in the vicinity of the drainage channel to remove invasive weeds and replace them with native plants. These wetland and watershed projects have increased stormwater retention capacity, reduced sedimentation into the Nu'upia Ponds and Kāne'ohe Bay and improved water quality. The projects have also created a more aesthetically pleasing environment and improved habitat for native waterbirds.

There are approximately 131 acres of U.S. Army Corps of Engineers jurisdictional wetlands at MCB Hawaii Kaneohe Bay, covering five sites. The largest concentration of wetlands are in and around the Nu'upia Ponds WMA. Pockets of wetland are located within the golf course, next to the Salvage Yard, and at West Field.

6.2.4 **Soils**

Soil types identified at MCB Hawaii Kaneohe Bay range from clay to fine beach sand and are shown on Figure 6-1. The majority of soils on the installation consist of well-drained soils developed from coral, lava, and/or alluvium, which provide a solid foundation for construction. Makalapa Clay (MdB, McB), a prominent soil type around the slopes of Ulupa'u Crater, has high expansion and contraction potential that makes it poor for construction purposes. Soils associated with Rock Land (rRK) have similar expansion and contraction characteristics (Department of the Navy 2006).

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by

overhead sun, heat, and mild tradewinds, while winter has higher rainfall, cooler temperatures, and stronger tradewinds. The predominant wind direction in the Hawaiian Island is from the east-northeast at 10 knots.

In the vicinity of MCB Hawaii Kaneohe Bay, the median annual rainfall is approximately 40 in. Monthly average low and high temperatures at MCB Hawaii Kaneohe Bay range from 76 to 85 degrees Fahrenheit in the warmest month (September) and from 69 to 79 degrees Fahrenheit during the coolest month (January).

6.2.6 Vegetation

Most of the developed land and open space at MCB Hawaii Kaneohe Bay contains planted landscape material, typically Bermuda grass and a variety of native and non-native planted trees and shrubs. The non-managed dry land vegetated areas, including around Pu'u Hawai'i Loa and Ulupa'u Crater, are dominated by non-native *koa haole* (*Leucanena leucocephala*) shrubland. Undeveloped shoreline areas include native sea strand vegetation.

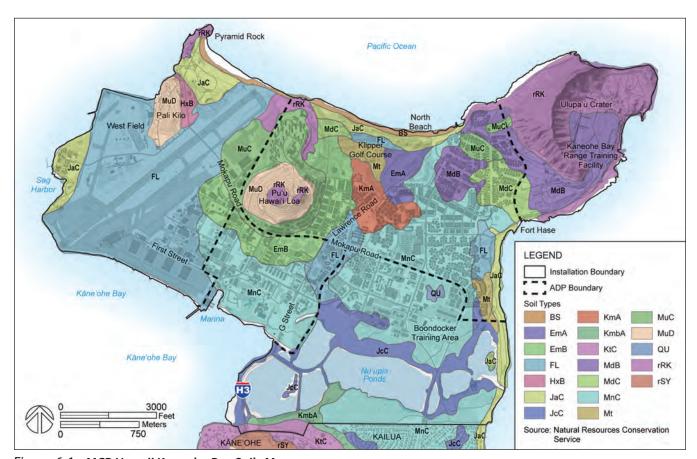


Figure 6-1 MCB Hawaii Kaneohe Bay Soils Map

According to the INRMP (2011), since 2008, natural resources staff have discovered several 'ōhai (Sesbania tomentosa) plants in the dune vegetation next to the shearwater colony on the Kailua Bay side of the installation. 'Ōhai is listed as a federal endangered species. The plants have been placed in custom built cages to protect them from rodents, and the area is monitored regularly by MCB Hawaii environmental staff. There are no other natural occurrences of plants currently listed or pending listing as endangered under the Federal Endangered Species Act. (Marine Corps Base Hawaii 2011 and Department of the Navy 2006).

6.2.7 Wildlife Habitat

There are two designated WMA at MCB Hawaii Kaneohe Bay: the 482-ac Nu'upia Ponds WMA and the 23-ac Ulupa'u Head WMA. The Nu'upia Ponds WMA provides habitat for endemic, endangered water birds, shorebirds, and seabirds, and provides refuge to 16 native fish species. The Ulupa'u Head WMA is one of two red-footed booby or ' \bar{A} (Sula sula rubripes) colonies in the main Hawaiian Islands. Although not a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many of the same waterbirds, shorebirds, and seabirds.

The waters off MCB Hawaii Kaneohe Bay are home to four federal-listed endangered species of animals, including the endemic Hawaiian monk seal or 'ilio holo i ka uaua (Neomonachus schauinslandi), the sperm whale (Physeter catodon), the migratory humpback whale or koholā (Megaptera novaeangliae), and the migratory hawksbill sea turtle or 'ea (Eretmochelys imbricata). The green sea turtle or honu (Chelonia mydas) is a federal-listed threatened species that has been observed in the area (Marine Corps Base Hawaii 2011).

6.3 Onsite Conditions

The Ground Support District primarily includes facilities that support Marine Corps ground and logistics units. These uses include bachelor housing and mess, training, administrative offices, storage and maintenance. Over half of the land area in this district is wetland and a designated WMA, and a large area is dedicated to ground unit training.

6.3.1 Land Use

Figure 6-2 illustrates land use within the Ground Support District, which is a mix of operational, training, administration, housing, and community support. The primary billeting and administrative uses are concentrated in the northern and western portion of the district and include unaccompanied personnel housing, the mess hall, playing fields and courts, and unit headquarters and command posts. Operations, supply, and training are largely concentrated are in the southern and eastern portions of the district and include motor pools, maintenance shops, warehouses, and secure communication facilities. Large training areas are in the eastern-most portion of the district. Lands within this district are under the control of the federal government and are not subject to any state or county land use controls or public access entitlements.

6.3.2 Transportation Network

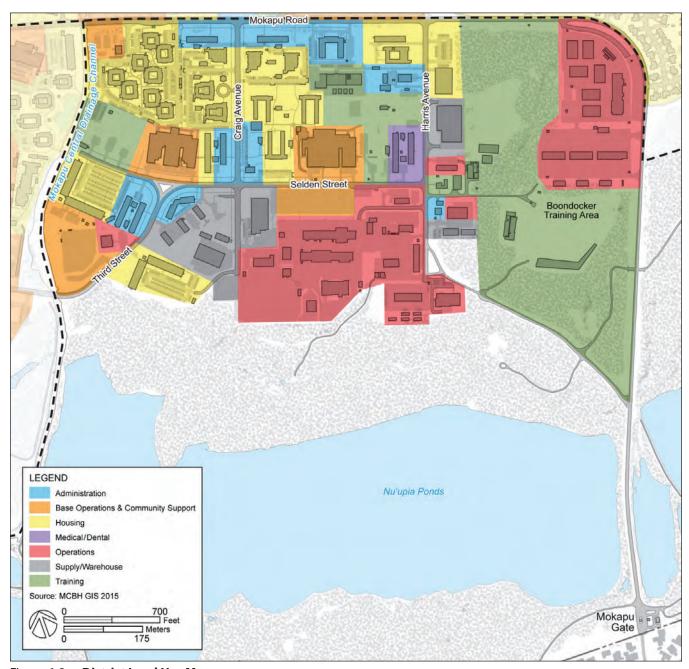
The Ground Support District is accessed directly through the Mokapu gate, located on the east side of the Mōkapu Peninsula. (b) (7)(F)

(b)
$$(7)(F)$$

Figure 6-3 illustrates the roadway network and major parking areas within the Ground Support District. All areas within the district are accessible via

(b)
$$(7)(F)$$

All roadways have sidewalks that connect to a thorough network of pathways that extend throughout the district, including a pedestrian bridge across the Central Mokapu Drainage Canal. The only dedicated bike lane in the district is along the east-bound lanes of Third and Seldon Streets. Lack of privately-owned vehicle (POV) parking is a major issue in the Ground Support District. The *Marine Corps Base Hawaii Kaneohe Bay Parking Study* (2014) identified a shortfall of approximately 1,345 stalls for areas within the district, resulting in the frequent parking along unimproved roadway shoulders.



District Land Use Map Figure 6-2

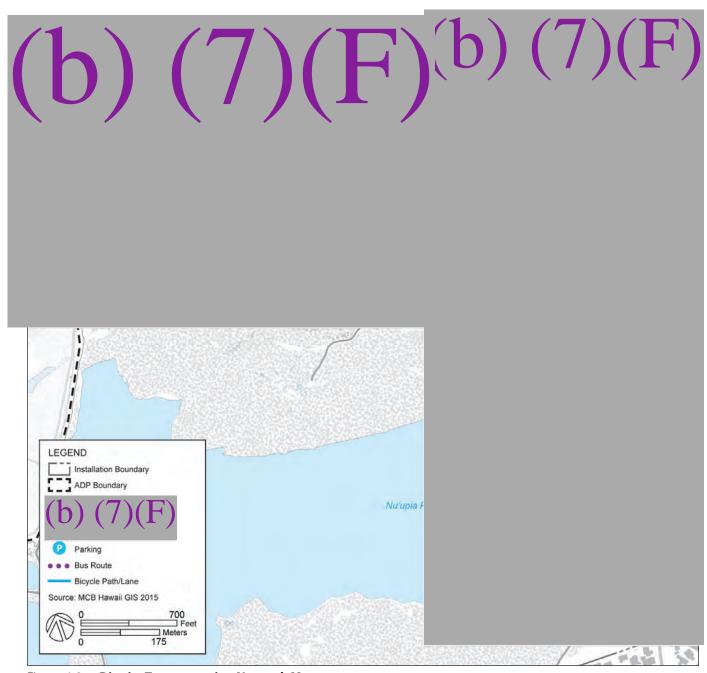


Figure 6-3 **District Transportation Network Map**

6.3.3 Utilities

This section provides an overview of the water, electrical, wastewater, storm drainage and communication systems at MCB Hawaii Kaneohe Bay and highlights utility issues specific to the Ground Support District.

Water System

Figure 6-4 illustrates the water distribution system in the Ground Support District. In general, the water supply, distribution, and storage capacity at MCB Hawaii Kaneohe Bay is adequate for existing and future needs in the Ground Support District. Future development at the baseball field, west of the CLB-3 motor pool, or east of 3d Radio Battalion operations will require extending the water distribution system.

The Ground Support District is served by the MCB Hawaii Kaneohe Bay water system, which is operated and maintained by the MCB Hawaii Facilities Department Maintenance Division. The potable water distribution system includes approximately 240,000 ft of water lines, two pump stations, five reservoirs, altitude valves, sectional valves, service valves, pressure regulating valves, fire hydrants, water meters, and a chlorination and fluoridation facility.

(b)
$$(7)(F)$$

BWS is under contract to provide 5,200 gallons per minute at 60 pounds per square inch (psi); however, actual service since 1999 has ranged from 100 to 110 psi. Daily water use measures approximately 2 million gallons per day with adequate pressure for all existing general uses. (b) (7)(F)

The capacity of the transformer supporting this facility limits the number of pumps that can operate at the same time, thereby limiting the amount of water pressure the installation can organically generate. There are no potable water wells on MCB Hawaii Kaneohe Bay.

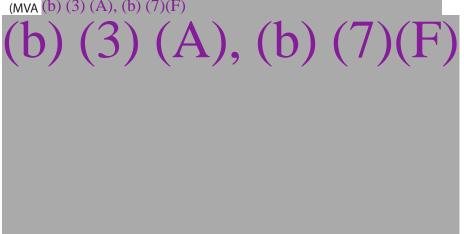
Wastewater System

Figure 6-5 illustrates the wastewater collection system in the Ground Support District. The wastewater collection system is generally adequate to support an increase in population, although future sewer line upgrades and pump station capacity upgrades may be necessary depending on the location. Future development located at the baseball field, west of the CLB-3 motor pool, or east of 3d Radio Battalion operations will require extending the wastewater collection system.

The MCB Hawaii wastewater collection system is operated by the MCB Hawaii Facilities Department. The wastewater collection system is comprised of approximately 920 manholes, 171,800 ft of gravity sewers and force mains, and 20 pump stations. Wastewater is collected and conveyed to the Water Reclamation Facility (WRF) located west of the main gate in the Base Support District. The WRF is a secondary biological treatment plant. MCB Hawaii seeks to upgrade the treatment and electrical systems of the plant in the near-term to provide redundant critical systems. Some treated R2-quality effluent is typically pumped to the Kaneohe Klipper Golf Course for irrigation while the rest is routed to the City and County of Honolulu Kailua Wastewater Treatment Plant for discharge through the Mōkapu deep ocean outfall under a National Pollutant Discharge Elimination System permit from the State of Hawai'i Department of Health (HHF Planners 2013).

Electrical System

Figure 6-6 illustrates the electrical distribution system in the Ground Support District. MCB Hawaii Kaneohe Bay is served from the 37.5 megavolt ampere



In 2013, a final EA and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV in non-family housing areas in partnership with NAVFAC HI. Sites approved for PV installation in the Ground Support District are also shown on Figure 6-6.

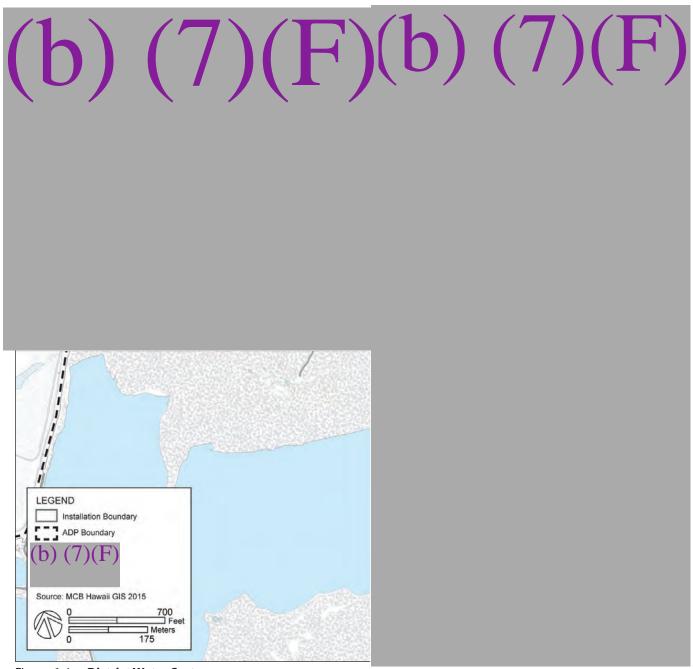


Figure 6-4 **District Water System**

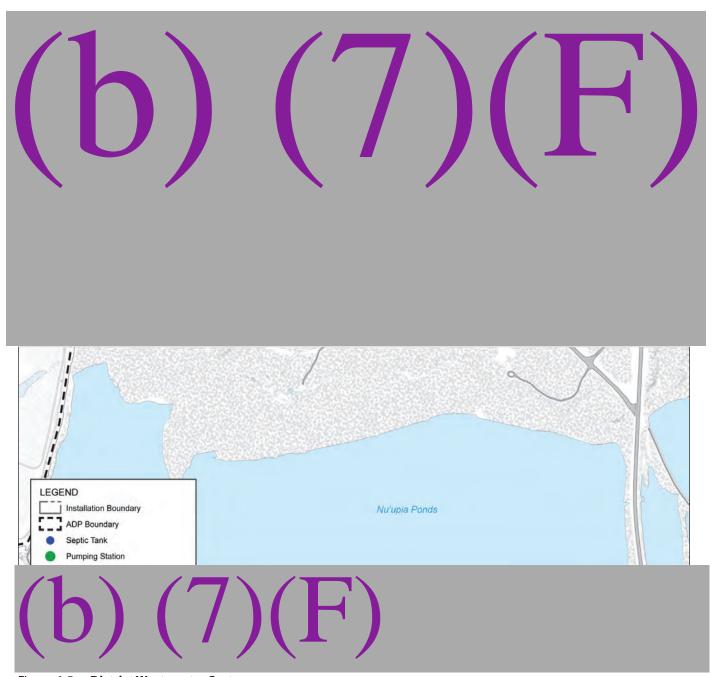


Figure 6-5 **District Wastewater System**

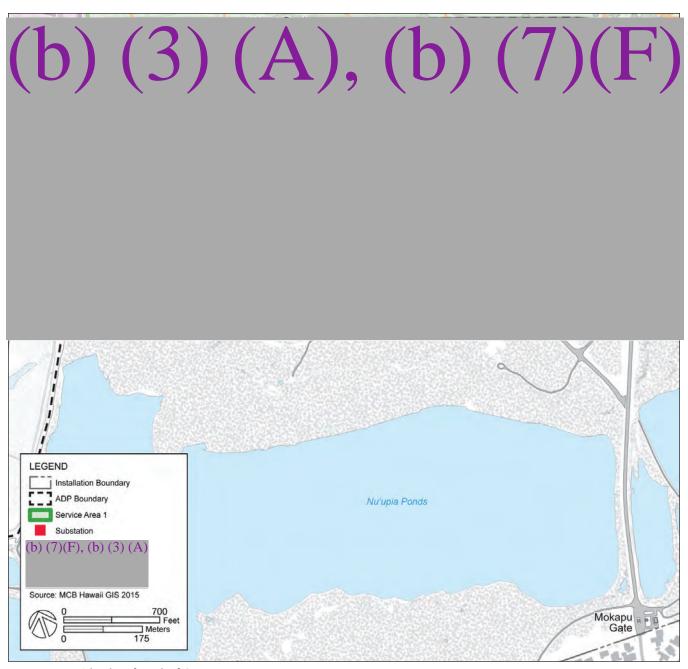


Figure 6-6 **District Electrical System**

Communications Infrastructure

Communication infrastructure is located in underground conduits across the district. An area distribution node is located in Building 1089 (mess hall) that provides communication service for the eastern half of the installation, including the 3d Marine Regiment and 3d Radio Battalion operation control centers, and ordnance operations and live-fire training in and around Ulupa'u Crater. The proposed replacement of this facility needs to account for the critical infrastructure

currently located inside. (b) (3) (A), (b) (7)(F) (b) (3) (A), (b) (7)(F)

Stormwater Management System

The MCB Hawaii Kaneohe Bay storm drainage system includes box culverts, drainage pipelines, and ditches, as shown on Figure 6-7. Over 20 storm drain outlets discharge into Kāne'ohe Bay, Kailua Bay, and Nu'upia Ponds. There are no reports of significant flooding issues during storm events in the Ground Support District.

Solid Waste Disposal

MCB Hawaii provides solid waste collection and disposal for administrative, industrial, military, commercial, and bachelor quarters areas of MCB Hawaii Kaneohe Bay. Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupa'u Crater. Waste amounting to approximately 5,000 tons per year is placed in the landfill. At the present rate of waste generation, the landfill site should accommodate MCB Hawaii Kaneohe Bay's requirements for another 10–20 years, provided there are no changes in current regulations and cover material is readily available. However, the Environmental Department is currently conducting a study to evaluate permanently closing the landfill prior to it reaching capacity. A commercial contract service collects solid waste from public-private venture (PPV) family housing areas for disposal at off-base facilities.

The MCB Hawaii Environmental Department operates a recycling center in Building 132 next to the marina. Traditional recyclables, wood pallets, and reusables from operational, maintenance, administrative, bachelor quarters, and community support areas are accumulated and processed for sale or for on-base reuse.

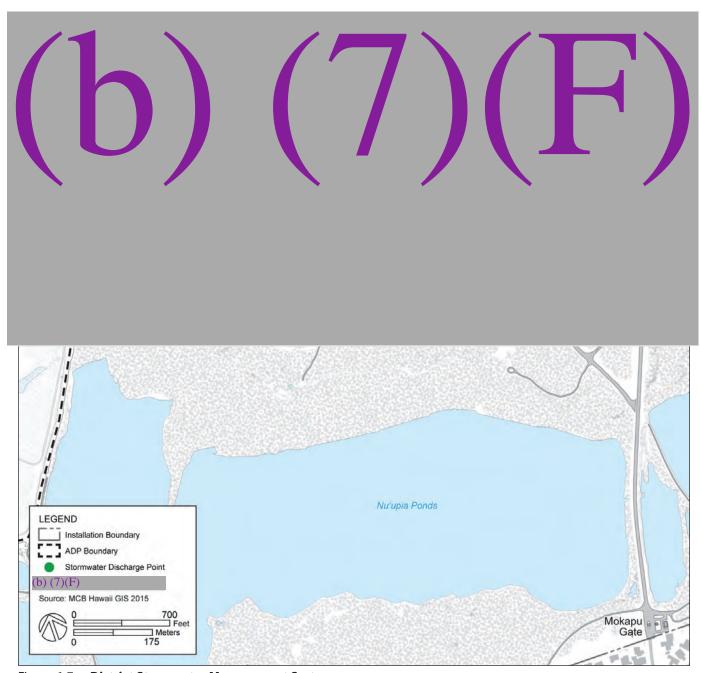


Figure 6-7 **District Stormwater Management System**

6.3.4 Environmental Conditions and Hazards

Figure 6-8 highlights specific environmental resources and hazards found in the Ground Support District.

Flood Plain

According to the Federal Emergency Management Agency the entirety of the developed area of the Ground Support District is designated Flood Zone D, an area where flooding is possible but risk in undetermined. Within Flood Zone D, 10-year and 100-year flood hazard areas associated with the Mokapu Central Drainage Canal have been identified (Department of the Navy, 2002, Rev. 2003). The Kailua Bay shoreline on the eastern edge of the district is susceptible to flooding from both storm surf (flood zone VE) and rainfall (flood zone AE). These flood prone areas are located within the Nu'upia Ponds WMA which precludes any development.

Wetland

The largest wetland in the Ground Support District is associated with the Nu'upia Ponds WMA and covers approximately 114 ac in total. This wetland is in the intertidal zone and regularly flooded. A small 1.3-ac wetland is also located west of the 3d Marines motor pool. A 100-ft buffer ensures natural vegetation cover is maintained and prevents development encroachment.

Wildlife Habitat

The Nu'upia Ponds WMA provides important bird habitat, and is home to approximately 10-percent of the endangered Hawaiian black-necked stilt (Himantopus mexicanus knudseni) population of Hawai'i. Three other endangered Hawaiian waterbirds that feed and breed at the WMA include the endemic Hawaiian duck or koloa maoli (Anas wyvilliana), the endemic Hawaiian coot or 'alae ke'oke'o (Fulica americana alai), and the endemic Hawaiian moorhen or 'alae 'ula (Gallinula chloropus sandvicensis). The Newell's shearwater or 'a'o (Puffinus auricularis) is a federal-listed threatened species that has been observed in the area. The endemic short-eared owl or pueo (Asio flammeus sandwichensis) is included on the state list of endangered species and has also been observed in the area. Many other waterbirds transit through the ponds yearly.

Installation Restoration Program Sites

Installation Restoration Program (IRP) sites are locations where releases of hazardous materials or petroleum products require remediation or other follow up efforts. Environmental restoration is completed under the MCB Hawaii IRP. There is one former IRP site in the Ground Support District—the Quarry Pit landfill. Future building development on this site is not recommended due to fill instability and on-going settlement.

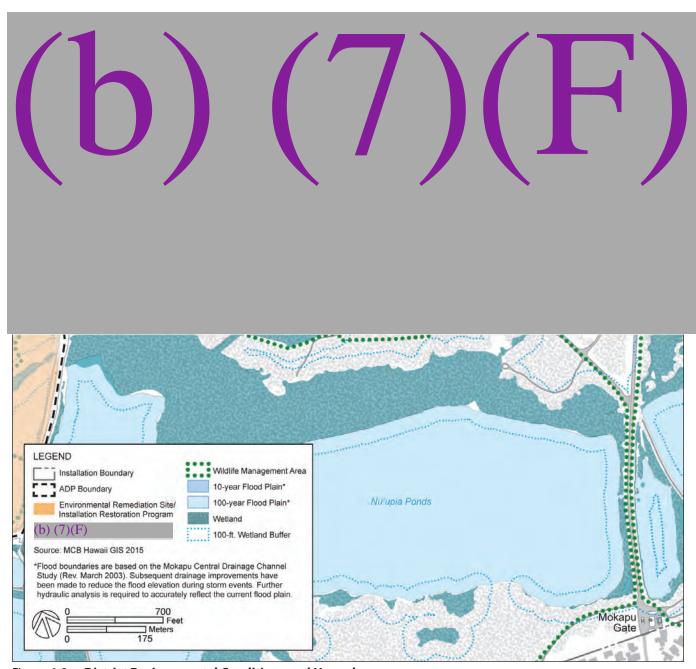


Figure 6-8 **District Environmental Conditions and Hazards**

6.3.5 Archaeological and Historic Architectural Resources

Figure 6-9 shows the archaeological and historic architectural resources in the Ground Support District.

Archaeological Resources

The Mōkapu Peninsula Fishpond Complex (Site 50-80-11-1002) generally aligns to the boundary of the Nu'upia Ponds WMA, and occupies the entire southern portion of the Ground Support District. The fishpond complex includes eight traditional Hawaiian fishponds called *Nu'upia 'Ekāhi, Nu'upia 'Elua, Nu'upia 'Ekōlu, Nu'upia 'Ehā, Heleloa, Halekou, Kaluapuhi,* and *Pa'akai*. Pre-contact and historic period archaeological sites in the fishpond complex include lithic scatters, burial areas, construction materials, and historic pond gates. The fishpond complex also includes cultural deposits in the southern Ulupa'u Dune, located along the eastern coast fronting Kailua Bay. In this area, numerous cultural features, including more than 60 prehistoric and historic burials, have been found. This area is thought to have been utilized as a temporary fishing camp used frequently over short periods of time. The complex has been determined eligible for listing on the National Register of Historic Places (NRHP) (Department of the Navy 2014).

Historic Architectural Resources

A number of architectural resources at MCB Hawaii Kaneohe Bay are listed or eligible for listing on the NRHP. Most of these are World War II era buildings and structures and are located in the Aviation District or Base Support District. Within the Ground Support District, two buildings are eligible for listing on the NRHP. Building 1086 is significant for its portrayal of mid-Century modern architectural style and its use as a Permanent Battalion Headquarters during the Cold War. It is currently used as CLB-3 Headquarters. Building 116 was originally the Mess Attendant's Barracks at the former Fort Hase, and is one of the last remaining examples of a WWII wood-framed support structure. It is currently a vacant communications/electrical shop.

6.3.6 Safety Hazards

There are no safety hazards related to military operations that constrain land use in the Ground Support District.

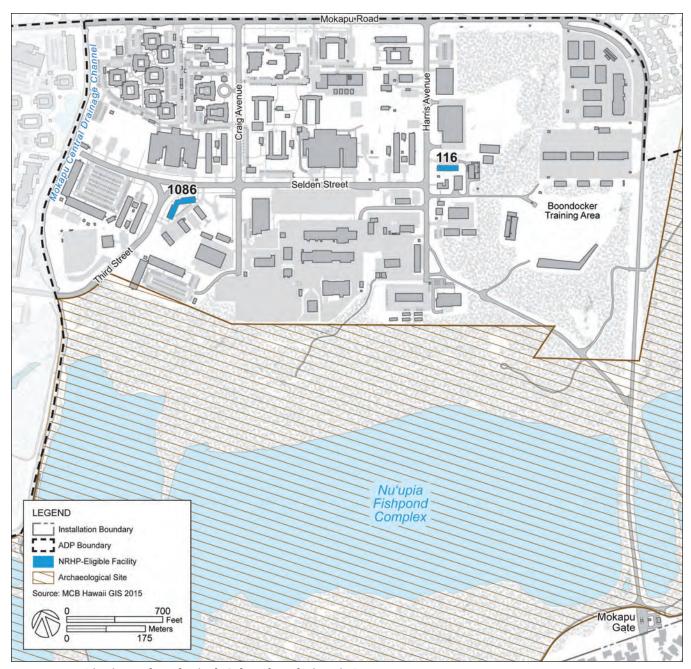


Figure 6-9 **District Archaeological, Cultural, and Historic Resources**

6.3.7 AT/FP Physical Security

AT/FP measures are intended to protect personnel, infrastructure and critical resources from outside attack. The AT/FP criteria mandate measures be taken in both site and building design, which can have an appreciable impact on site and building planning, as well as on construction cost.

The Ground Support District fronts the waters of Kailua Bay on the east and Kāne'ohe Bay on the west. Access to waters surrounding the Mōkapu Peninsula are subject to a 500-yard security buffer due to its designation as a Naval Defensive Sea Area. The district abuts civilian lands on its south side, but operational areas of the base are naturally buffered by the presence of the Nu'upia Ponds. Vehicles entering the Mokapu gate traverse the wetland area along an entry road which extends for nearly a half mile before entering the occupied portion of the base. (b) (7)(F)

Within the boundary of the installation, additional AT/FP guidelines dictate separation distances between roadways and buildings, which can affect building orientation, setbacks from roadways and parking areas, adjacencies between buildings, and construction types. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-01*, *Installation Master Planning* (May 2012). Figure 6-10 shows lands in the Ground Support District encumbered by the

6.3.8 Sources of Air, Noise, and Light Pollution

There are no reported sources of air or noise pollution in the Ground Support District. Night time light sources associated with urbanization are an ongoing concern for migratory seabirds.

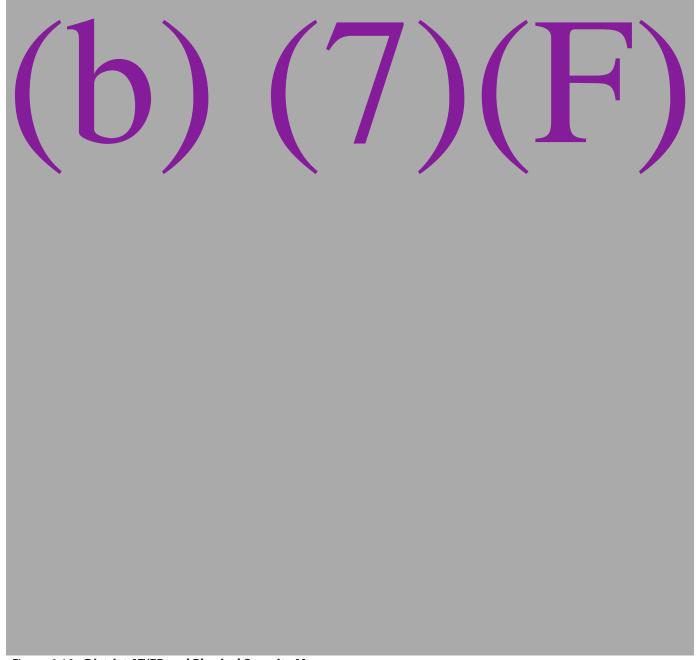


Figure 6-10 District AT/FP and Physical Security Map

6.4 Alternative Site Development and Evaluation

Alternative site development plans were developed through a multi-step process involving key installation stakeholders, including representatives from MCB Hawaii departments, operational commands, and other supporting elements. A four-day charrette allowed participants to develop a variety of possible planning actions to address identified facility and land use issues in the Ground Support District. These concepts were revised and presented as alternatives to stakeholders at a three-day Concept Workshop where they were evaluated and additional guidance and direction was provided for further plan refinement. The alternatives ultimately sought different ways to modify administrative and community support land uses in relation to operational and training areas, and considered different locations for the following.

- Unit and functional consolidation throughout the district
- Consolidation of headquarters in new facilities
- Replacement of the 1600-series and Wounded Warrior Battalion (WWBN) BEQs
- · Increasing open areas for small unit training
- · Siting a new mess hall and satellite fitness center
- Siting district parking structures
- · Redevelopment of the warehouse facilities
- · Reservation of land for future, unknown missions

The Charrette Summary Report (IMP Appendix A) and Concept Workshop Report (IMP Appendix B) thoroughly document the attendees, planning concepts, plan alternatives, and evaluation of the alternatives during the plan development process. Subsequent to the Concept Workshop, a preferred alternative for the Ground Support District was presented to MCB Hawaii leadership.

Leadership's final guidance is reflected in the ADP presented in Section 6.5. One alternative proposal not carried forward in the *Ground Support District ADP* is the construction of a satellite fitness center. Expanding the existing Building 3037 facility onsite in the Base Support District is identified as the preferred location to meet this requirement.

6.5 Area Development Plan

This section presents the ADP for the Ground Support District at MCB Hawaii Kaneohe Bay. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific district-level goals and objectives. Future development envisioned for the Ground Support District is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.5.1 Illustrative Plan

The Illustrative Plan graphically portrays planned, programmed, and recommended future development that supports the overarching planning goals for MCB Hawaii Kaneohe Bay. The Ground Support District Illustrative Plan (Figure 6-11) presents a strategy to increase density through the redevelopment of aging facilities while preserving training areas and maximizing the amount of developable land in the district. Important plan features culminating from the IMP planning process are described in detail as follows.

3d Marines Headquarters Complex

Construct a 3d Marines headquarters complex south of Mokapu Road between Craig and Harris Avenues. The complex is centered on a two-story Regimental Headquarters (14,800 sf) setback from the road and fronting an approximately one-acre parade ground, with 2-story Battalion Headquarters located on either side and each sized (22,700 sf) to accommodate two units (four units total). A three-story parking structure accessed from Harris Avenue provides 200 POV stalls. Sites for additional buildings are identified as capacity is needed to meet future administrative requirements in the district. The development of this complex improves land use by relocating the 3d Marine Regiment Headquarters out of the Community Support District and provides ground units with modern and efficient administrative buildings in a campus setting. Currently, all ground unit headquarters occupy space in buildings constructed in 1953.

Enlisted Dining Facility

Replace existing enlisted dining facility (constructed in 1953), with a new 48,300-sf facility at the west end of Selden Street. This location is central to all unaccompanied personnel housing in the Ground Support and Base Support Districts. The existing footbridge over the Central Mokapu Drainage Canal should be widened to improve pedestrian connection between the two districts. A communications area distribution node is located in Building 1089 (existing mess hall) that provides service for the eastern half of the installation, including the 3d Marine Regiment and 3d Radio Battalion operation control centers, and ordnance operations and live-fire training in and around Ulupa'u Crater. The proposed replacement of this facility needs to account for the critical infrastructure currently located inside.

Bachelor Enlisted Quarters Redevelopment

Develop a new cluster of five-story BEQs totaling 800 bed spaces north of Seldon Street and west of Craig Avenue to replace four 1600-series BEQs (Buildings 1634, 1635, 1655, and 1656 totaling 744 bed spaces) constructed in the mid-1970s. This includes a 35-room Americans with Disability Act -compliant facility with storage and Company headquarter space for the WWBN Detachment Hawaii. A five-story, 560-stall parking structure is screened by the barracks and accessed from a realigned Third and Selden Street intersection or the existing surface lot to the north and provides a land efficient way to meet

POV parking requirements. This development clears aging and land-intensive BEQ development to provide approximately 11.9 ac to support existing and future operational uses.



Shared classroom and covered weapons cleaning areas could reduce the facility requirement to 7,350 sf.

3d Marines Supply Depot

Consolidate 3d Marines and 1/12 organic unit storage in a single 38,000-sf high bay warehouse with administrative supply offices on a mezzanine level, sized to meet Regimental, Battalion, and CAC requirements. Building 1092, the primary 3d Marines supply warehouse, was constructed in 1953, while other warehouse facilities currently being used, Buildings 374 and 6078 in the Aviation and Base Support Districts respectively, are proposed for demolition as part of those district's ADPs. CAC equipment is currently stored remotely at PCA.

3d Marines Permanent Vehicle Storage

Replace the existing six temporary vehicle storage structures at the 3d Marines motor pool with three 20,000-sf permanent buildings to protect vehicles and equipment from corrosive environmental conditions.

MCCS Distribution Warehouse

Construct a 31,500-sf MCX distribution warehouse across from the existing Building 1404 MCX distribution facility to consolidate storage operations by relocating material currently stored at PCA.

Training Open Space

Relocate functions in Building 1090 and demolish the facility to expand the open field used for small unit formation and training south of the (b) (7)(F) (b) (7)(F) Retail functions in Building 1090 will be replaced by the MCCS Wiki Wiki Marine Mart constructed on the corner of Craig Avenue and Selden Street (on Warrior Field). The MCX furniture store will be consolidated into the expansion of the main MCX (Building 6109) at the Mokapu Mall. The Operations & Training classroom will be replaced by MILCON project Consolidated Classroom Facility (P-944). Land west of Building 4088 should be cleared and graded for use as additional small unit training, command post exercises, and unit marshaling.

CLB-3 Engineering Services Company

Relocate CLB-3 Engineering Services Company facilities, including administration, shops, vehicle maintenance, and organic unit and open area storage to location at the south end of Craig Avenue. The primary weight handling equipment shops (Building 1565) was constructed in 1958 and is surround by an unpaved, dirt lot used for organizational vehicle parking, open area storage and temporary storage structures.

Land Reservation

The *Ground Support District ADP* identifies 17.2 ac of land to support future infill development. The site west of Third Street is the largest contiguous area identified by any MCB Hawaii Kaneohe Bay ADP. In the short- and mid-term, the existing parking lot will remain to support the surrounding functions until a future demand is identified to redevelop the 10.4-ac site.

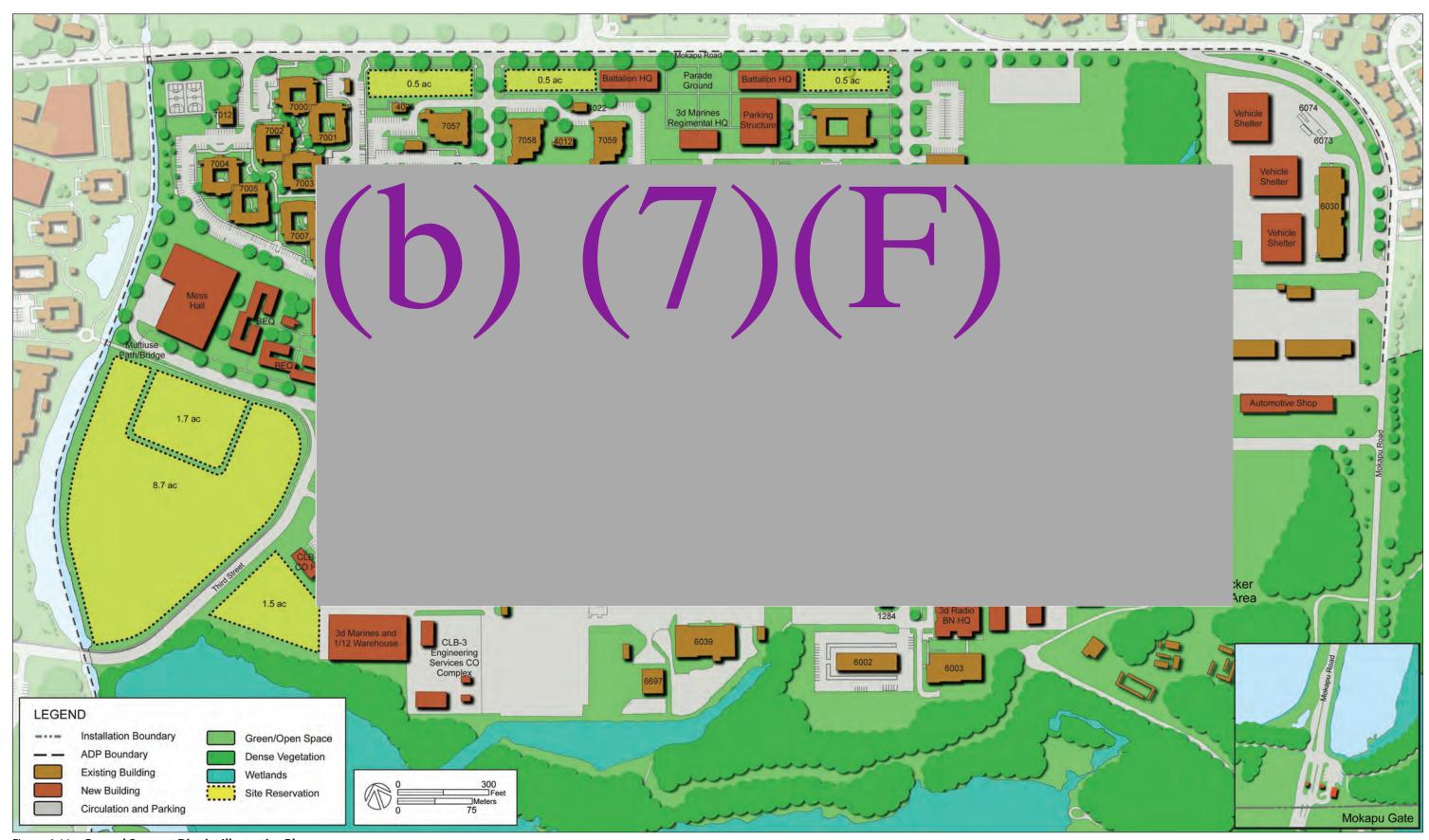


Figure 6-11 **Ground Support District Illustrative Plan**

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Marine Corps Base Hawaii Installation Master Plan

Ground Support District Area Development Plan

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2 Section 6 | ADP Area Analysis FOR OFFICIAL USE ONLY

6.5.2 Regulating Plan

The Regulating Plan, shown on Figure 6-12, provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum and maximum building heights (number of stories) to appropriately increase development density at MCB Hawaii Kaneohe Bay. The building height guidelines intend to maximize the development potential of the installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for the Ground Support District continues the existing administrative, operational, industrial, billeting, and training uses and identifies appropriate design characteristics and uses for infill development areas. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01*, *Installation Master Planning* (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)
- Medical Building Types (medical centers and clinics)
- Commercial/Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, bowling alley, and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.5.3 Circulation and Parking Plan

The overall goal of the Ground Support District Circulation and Parking Plan, shown on Figure 6-13, is to improve vehicular flow and pedestrian safety, reduce the amount of surface parking while providing the required number of stalls, and increase walkability and bicycle riding throughout the district. Parking structures are proposed to meet POV parking requirements for both the 3d Marines Headquarters Complex and BEQ Cluster redevelopment. Restriping Selden Street and Craig and Harris Avenues to include bike lanes within the 36-ft road right-of-way will add almost two miles of dedicated bike infrastructure to the district. Widening the existing narrow pedestrian bridge across the Central Mokapu Drainage Channel to accommodate more pedestrian traffic as well as connect the Selden Street bike lane to the Base Support District will improve the quality of life of Marines as they move across the installation.

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Marine Corps Base Hawaii Installation Master Plan **Ground Support District Area Development Plan**

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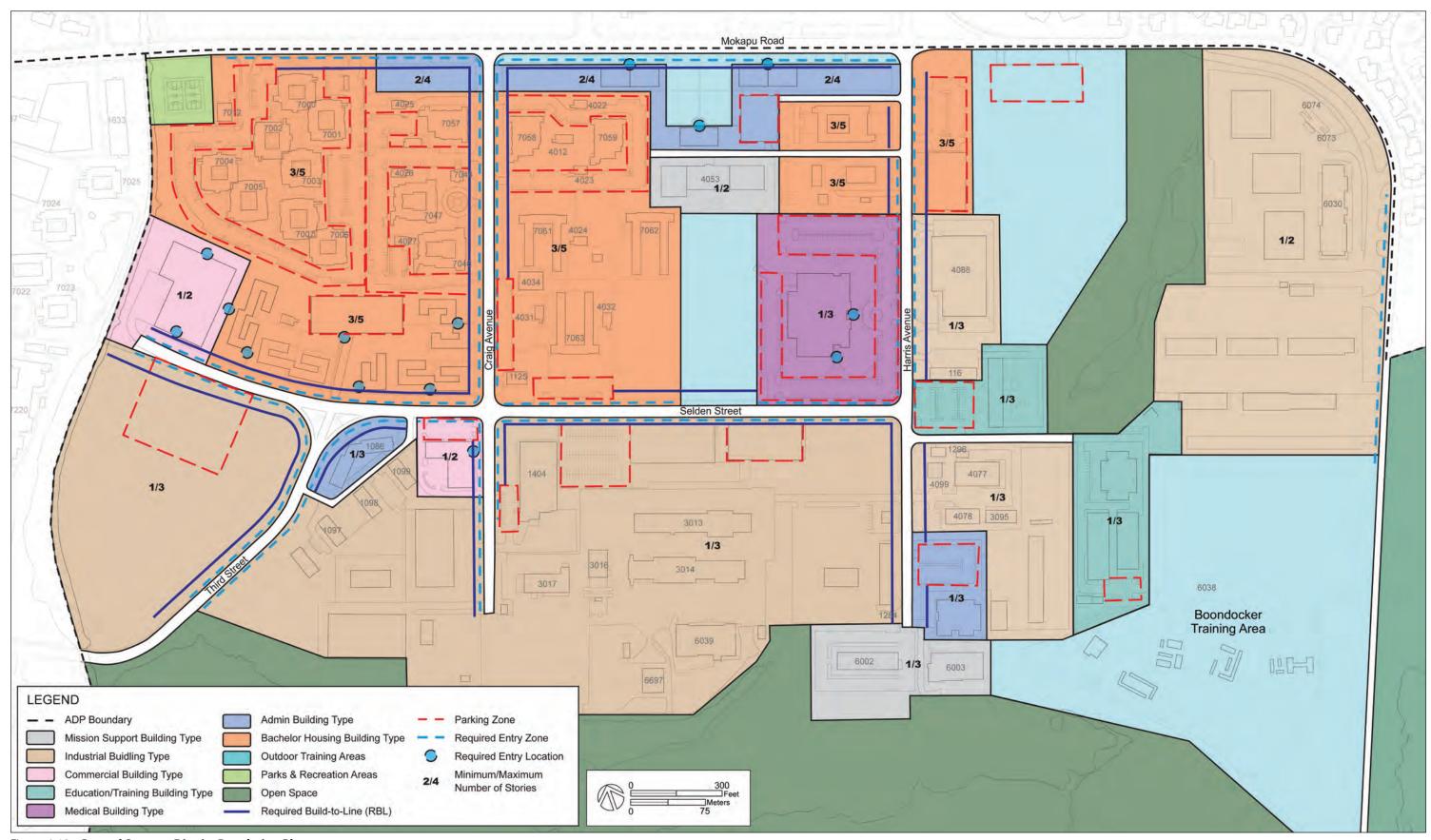


Figure 6-12 **Ground Support District Regulating Plan**

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Marine Corps Base Hawaii Installation Master Plan

Ground Support District Area Development Plan

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Section 6 | ADP Area Analysis FOR OFFICIAL USE ONLY

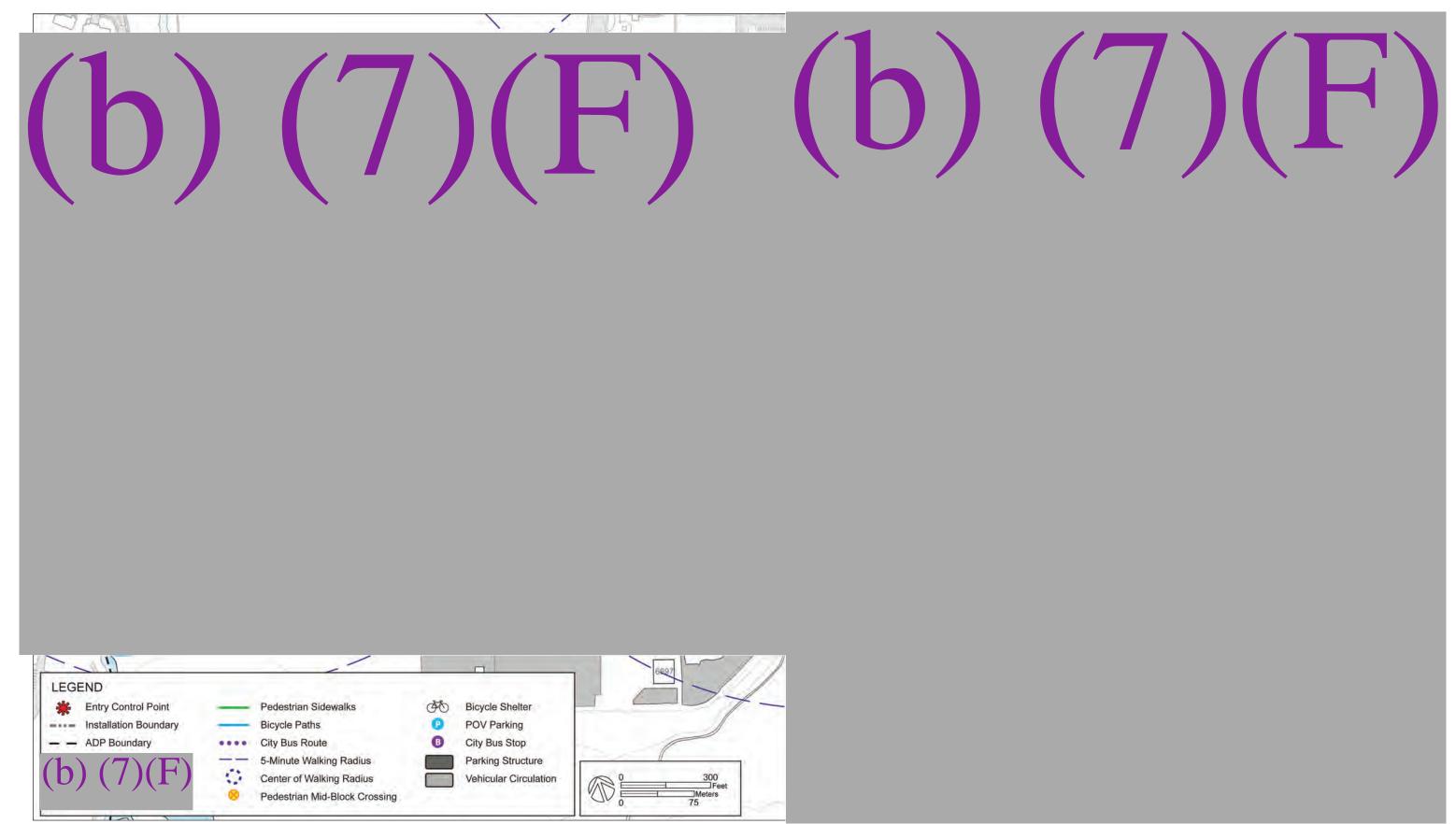


Figure 6-13 Ground Support District Circulation and Parking Plan

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Marine Corps Base Hawaii Installation Master Plan

Ground Support District Area Development Plan

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Section 6 | ADP Area Analysis FOR OFFICIAL USE ONLY

7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Ground Support District ADP* presented in the context of the installation's existing CIP. Dependent actions and project phasing required for implementation are identified. The plan is presented graphically on Figure 7-1, and detailed in Table 7-1, which describes each planning action, including any required demolition or other dependent actions.

The timeframe of each planning action is classified as short-term, midterm, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions consist primarily of existing projects developed as part of the installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D. Modifications to the scope of existing projects are noted and list an updated ROM cost where appropriate.

Table 7-1 **Summary of Proposed Development Actions** (Map ID 1–6)

		•		
MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE & DESCRIPTION	ROM COST (\$K)
1	Short-term FY14 CCD 8/17	P-778	(b) (7)(F)	(b) (5)
2	Short-term FY14 CCD 10/16	P-852	3d Radio Battalion Maintenance/Operations Complex • Headquarters, classroom, and training space	
3	Short-term FY15 CCD 8/18	P-861	 VMU, MWSD, and CH-53E Upgrades New 3d Radio BN auto organizational shop New MWSD construction and weight handling equipment shop in B373 in Aviation District Modernized administrative spaces and construct SCIF in Hangar 102 in Aviation District 	
4	Short-term FY15 EAD 9/15	P-924	MV-22 EIS Traffic Improvements Reconfigure Third and Selden Streets intersection	
5	Short-term FY16 EAD 4/16	P-78150	Medical/Dental Clinic Replacement Consolidates all unit garrison aid stations in multi-story clinic	
6	Short-term FY17	P-923	(b) (3) (A) , (b) $(7)(F)$	

Table 7-1 Summary of Proposed Development Actions (Map ID 7–16)

MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE & DESCRIPTION	ROM COST (\$K)
7	Short-term FY17	Proposed	Wiki Wiki Marine Mart • Relocates retail tenants in B1090	(b) (5)
8	Short-term	P-877	(b) (7)(F)	
9	Short-term	P-373 Modified	AAV Maintenance Facility Replace headquarters demolished by P-78150 Existing facility inadequately supports mission and equipment maintenance Realign access road to CLB motor pool	
10	Mid-term	P-843	Multipurpose Training Complex - Support individual and small unit training - Includes combat simulator facility, rappelling tower, and gas chamber	
11	Mid-term	P-847	(b) (7)(F)	
12	Mid-term	P-944	Consolidated Classroom Facility Dedicated operations and training classroom Demolish 6709C3	
13	Mid-term	P-945	Combat Training Tank Dedicated combat training tank Existing facility co-operated as community pool	
14	Mid-term	Proposed	3d Marines Headquarters Phase I Construct two 2-story BN Headquarters facility (22,700-sf each) Demolish B1027, B1033, B1034, B1064, B1069, B1087, and B4028	
15	Mid-term	P-880 Modified	3d Marines Headquarters Phase II Construct two-story REG Headquarters facility (14,800-sf) Construct three-story 200-stall parking structure New location proposed south of Mokapu Road	
16	Long-term	P-837	Enlisted Dining Facility Construct 48,300-sf facility Widen canal bridge to accommodate multiuse path Demolish B1089 Use existing parking lot across Selden Street until demand identified for future function Temporary parking - across Golden Street	

Table 7-1 **Summary of Proposed Development Actions** (Map ID 17–25)

Table 7-1	Julillial y 0	rroposeu	Development Actions (Map ID 17-25)	
MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE & DESCRIPTION	ROM COST (\$K)
17	Long-term	Proposed	Bachelor Enlisted Quarters Redevelopment Construct four five-story bachelor enlisted quarters (800 bed spaces) Construct five-story 560-stall parking structure Reuse B4034 as Company CPs or fitness room as needed Demolish B1634, B1635, B1655, and B1656	(b) (5)
18	Long-term	P-888 Modified	Wounded Warrior BEQ • Multistory facility • Site in BEQ complex central to medical and mess facilities	
19	Long-term	Proposed	CLB-3 Company Headquarters Construct two-story facility (4,020 sf) Demolish B1044, B1074, B1108, B4015, and B4030	
20	Long-term	Proposed	(b) (7)(F)	
21	Long-term	Proposed	3d Marines and 1/12 Warehouse Construct 32,000-sf warehouse Demolish B1092, B1416, and B5099	
22	Long-term	Proposed	 Engineering Services Company Complex Construct carpentry shop, weight handling shop, and grease and wash rack Demolish B1565, B1677, B4079, and B6716C3 	
23	Long-term	Proposed	3d Marines Vehicle Shelters Construct three 20,000-sf vehicle storage sheds Demolish temporary structures	
24	Long-term	Proposed	Training Open Space Demolish B1090 after functions relocate Grub and grade area east of B4088	
25	Long-term	Proposed	MCCS Exchange Distribution Warehouse Construct 31,500-sf warehouse Relocate material from PCA	

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Marine Corps Base Hawaii Installation Master Plan **Ground Support District Area Development Plan**

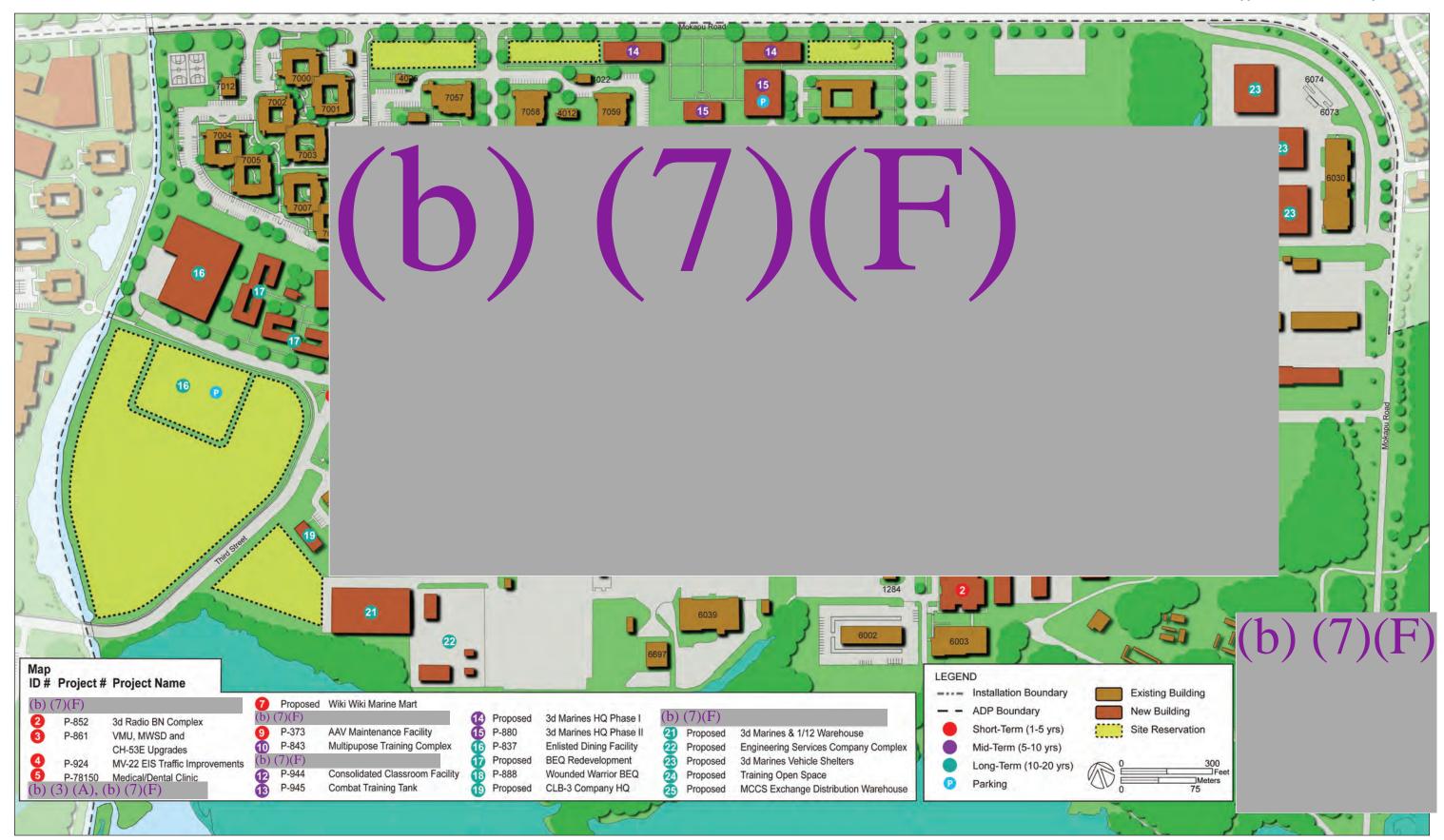


Figure 7-1 **Ground Support District Area Development Execution Plan**

Marine Corps Base Hawaii Installation Master Plan
Ground Support District Area Development Plan

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7.2 Demolition Plan

Figure 7-2 highlights facilities proposed for demolition in the Ground Support District. These facilities have either exceeded their economic life and require replacement, are excess and no longer need to meet facility requirements, or need to be relocated to support other development actions. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition** (Facilities 1027–1416)

FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT
1027	1/12 Headquarters	13,998	63	1953
1033	3d Marines Battalion HQ	14,028	63	1953
1034	Vacant/Fitness Room	22,516	63	1953
1043	IPAC Office*	20,832	63	1953
1044	CLB-3 Company HQ/DEERS	21,251	63	1953
1045	Elec/Comm Maint Shop	13,998	63	1953
1057	Garrison Aid Station*	23,261	63	1953
_(b)	(3) (A), (b)	o) (7)	(F)	
1069	3d Marines CP*	870	63	1953
1074	CLB-3 Family Readiness Office*	870	63	1953
1080	Medical Clinic	870	63	1953
1087	Headquarters, Battalion	13,073	63	1953
1089	Mess Hall*	65,181	63	1953
1090	MCX Annex*	73,442	63	1953
1092	Warehouse*	20,228	63	1953
_(b) _ _	(3) (A)	, (b)	(7)	
1199	Toilet	210	54	1962
(b) (3)	(A), (b) (7)(F)			
1287	Loading Ramp	260	51	1965
1288	Grease Rack	704	51	1965
1416	Warehouse*	4,000	43	1973

* Denotes a facility encumbered by an existing NAVFAC Energy Savings Performance Contract (ESPC) and/or Solar MAC contract. ESPC contract encumbrance continues until September 2030. Solar MAC contract encumbrance runs 25 years from installation, which is currently expected to be completed prior to 2017 and run through 2041. Contract termination costs should be considered during project programming.

Table 7-2 **Summary of Proposed Demolition** (Facilities 1565–6755C3)

Table 7-2	ble 7-2 Summary of Proposed Demolition (Facilities 1565–6755C3)			
FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT
1565	Heavy Equipment Maintenance*	7,000	58	1958
1634	Bachelor Enlisted Quarters*	39,228	41	1975
1635	Bachelor Enlisted Quarters*	30,663	41	1975
1648	Equipment Building	483	41	1975
1655	Bachelor Enlisted Quarters*	42,924	40	1976
1656	Bachelor Enlisted Quarters*	38,709	40	1976
1675	Equipment Building	400	40	1976
1677	Carpentry Shop	960	32	1984
3025	Recreation Pavillion	375	37	1979
4011	Company/Battalion HQ	3,263	28	1988
4014	Company/Battalion HQ	3,263	28	1988
4015	Company/Battalion HQ	3,263	28	1988
4020	Company/Battalion HQ	2,478	28	1988
4021	Company/Battalion HQ	2,478	28	1988
4028	Administrative Offices/Storage	2,478	28	1988
4030	CLB-3 Chaplain/Base RSO*	2,358	28	1988
(b) (7)	(F)			
4079	Construction Engineering Shop/ Instruction Facility*	3,000	29	1987
5099	1/12 Supply/Maintence Admin*	1,804	27	1989
6001	Vehicle Wash Pad	1,250	26	1990
6006	Gas Chamber	1,792	25	1991
6017	Monitoring Well	36	27	1989
6075	Leadership Reaction Course	13,701	25	1991
6660	BQ Recreation Shelter	225	13	2003
6708C3	VCCT Trailer	5,880		
6709C3	G3 Training Auditorium	9,000		
6710C3	Heat Training Facility	4,000		
6716C3	Engineering Service CO Storage	3,200		
6733R	Temporary Operational Storage	5,000		
6734R	Temporary Operational Storage	5,000		
6735R	Temporary Operational Storage	5,000		
6736R	Temporary Operational Storage	528		
6755C3	Modular Range Maintenance Facility	1,290		

Table 7-2 **Summary of Proposed Demolition** (Facilities 6756C3–6808)

FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT
(b)	(7)(F)			
6771C3	Operator Driver Simulator	630		
6781C3	SAVT Trainer	3,520		
6808	MCIT Powerstand	747	4	2012

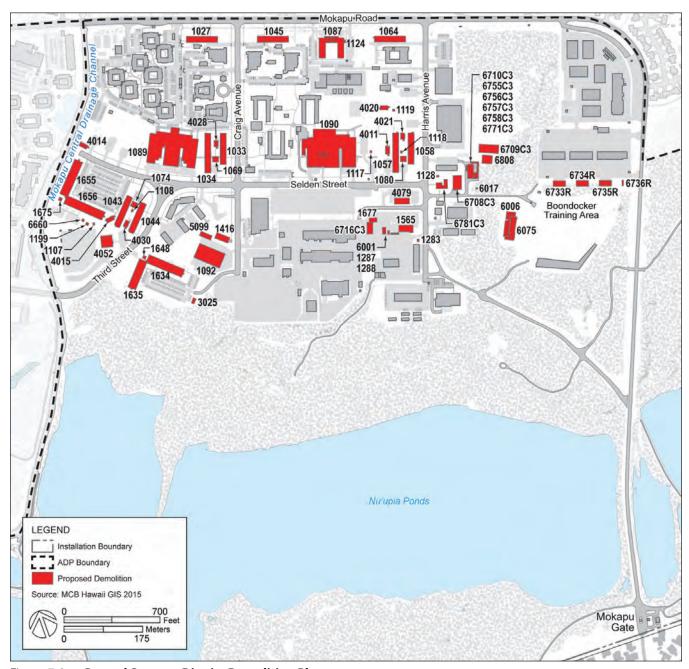


Figure 7-2 **Ground Support District Demolition Plan**

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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	HMLA	Marine Light Attack Helicopter Squadron	
AC	Acre	ШО	·	
AAV	Assault Amphibian Vehicle	НО	Holes, Number of	
ADP	Area Development Plan	HQ	Headquarters	
AICUZ	Air Installations Compatible	HSM	Helicopter Maritime Strike Squadron	
	Use Zones	ICRMP	Integrated Cultural Resources Management Plan	
AT/FP	Antiterrorism/Force Protection	IMP	Installation Master Plan	
BFR	Basic Facility Requirements			
BN	Battalion	INRMP	Integrated Natural Resources Management Plan	
BWS	Board of Water Supply	IN	Inches	
CCD	Construction Completion Date	kV Kilovolt		
CCN	Category Code Number	LOGCOM	Marine Corps Logistics Command	
CDC	Child Development Center	MAG	Marine Aircraft Group	
CDET	College of Distance Education and Training	MAGTF	Marine Air Ground Task Force	
CIP	Capital Improvement Plan	MAR REG	Marine Regiment	
CISD	Communications Information	MARFORPAC	Marine Forces Pacific	
CI3D	Systems Directorate	MCAS	Marine Corps Air Station	
CLB	Combat Logistics Battalion	MCB Hawaii	Marine Corps Base Hawaii	
CPRW	Commander, Patrol and	MCCS	Marine Corps Community Services	
	Reconnaissance Wing	MCO	Marine Corps Order	
DNL	Day-night Equivalent Sound Level	MCTAB	Marine Corps Training Area Bellows	
DoD	Department of Defense	MCX	Marine Corps Exchange	
ea	Each	MILCON	Military Construction	
EA	Environmental Assessment	MSL	Mean Sea Level	
EAD	Estimated Award Date	MVA	Mega Volt Ampere(s)	
ESPC	Energy Savings Performance Contract	MWR	Morale, Welfare, and Recreation	
FT	Feet	MWSD	Marine Wing Support Detachment	
FY	Fiscal Year	NAS	Naval Air Station	
GIS	Geographic Information System	NAVFAC PAC	Naval Facilities Engineering Command Pacific	
HABS	Historic American Buildings Survey			
HECO	Hawaiian Electric Company	NRHP	National Register of Historic Places	

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PCA Pearl City Annex

PMO Provost Marshal's Office

PN Personnel

PPV Public Private Venture
PSI Pounds per Square Inch

PV Photovoltaic

ROM Rough Order of Magnitude

RTF Range Training Facility
SAIA Sikes Act Improvements

Amendments

SDZ Surface Danger Zone
SF Square foot/square feet

SOCPAC Special Operations Command

Pacific

SOI School of Infantry

TECOM Marine Corps Training and

Education Command

TSF Training Support Facility
UDP Unit Deployed Program
UFC United Facilities Criteria
USPACOM U.S. Pacific Command

UM Unit of Measure

VR Navy Reserve Squadron

WMA Wildlife Management Area

WRF Water Reclamation Facility

WWBN Wounded Warrior Battalion

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FOR OFFICIAL USE ONLY Introduction



1 Vision, Goals, and Objectives

1.1 Background

The Community Support District at MCB Hawaii Kaneohe Bay occupies the north and central portion of the Mōkapu Peninsula as shown on Figure 1-1. The ocean-front Kaneohe Klipper Golf Course occupies nearly one-third of the usable land within the district. Most of the remaining land surrounding the golf course is occupied by family housing which are clustered in eight communities distinguishable by their period of construction, unit type, and architectural style. Other community support facilities include an elementary school, three child development centers (CDC), a chapel, a post office, a youth center, the Officer's Club, and temporary lodging.

Mokapu Mall, the major retail center on the installation, includes the commissary, exchange, retail stores, and a food court. Most community support facilities are located off of Mokapu Road, which forms the southern boundary of the district. A limited number of mission support facilities are in the district, including the 3d Marines Regiment Headquarters, an adjacent operational trainer facility, a telecommunications center, and airfield-related radar atop Pu'u Hawai'i Loa, also referred to as Kansas Tower.

The Community Support District shares the installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

Planning Mission

To provide housing, recreation, services, and amenities for the well-being, morale, and safety of the military personnel, their families, and the civilian workforce at MCB Hawaii Kaneohe Bay

Planning Vision

To create safe, people-friendly neighborhoods connected by tree-lined streets, wide sidewalks, and great open spaces that link housing to services and amenities

1.2 Community Support District

The Community Support District has its own vision, goals, and objectives that take into consideration the District's unique mission, functions, location and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable. The planning goals and objectives were developed during the visioning workshop and subsequently refined at the planning charrette and concept workshop.

The planning goals of the Community Support District include the following:

- Consolidate community support and major retail functions: Increase
 community support and retail activity in and around Mokapu Mall
 to expand the installation's community core area, improve access to
 facilities, and provide a destination shopping experience.
- Replace aging infrastructure: Facilities in the district that no longer adequately meet current requirements or are deteriorating should be demolished to reduce ongoing maintenance costs and provide space for redevelopment, as appropriate.
- Improve traffic congestion: Mokapu Road is one of the installation's primary thoroughfares and regularly experiences degraded quality of service, especially at peak times in the morning and afternoon.
- Improve alternative transportation networks: Provide safe routes for students to walk and bike to school and for residents to access the community core as an alternative to driving.
- Enhance recreation facilities: The district provides some of the nicest beaches and recreation areas on the installation, but facilities and infrastructure are limited and do not meet the demand.

The specific planning objectives of the *Community Support District ADP* include the following.

- Resite a new Mokapu Elementary School
- Construct a fitness center around Mokapu Mall
- Construct a theater around Mokapu Mall
- · Construct a library around Mokapu Mall
- Relocate golf course maintenance and cart storage warehouse
- Improve pathway connections to form a more complete network
- Develop beach park amenities at North and Fort Hase beaches
- · Identify land for additional family housing development

2 Facility Requirements and Land

This section of the plan establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Community Support District ADP* is based.

2.1 Area Force Loading

2.1.1 MCB Hawaii Kaneohe Bay

Estimated personnel loading data for FY18 indicate MCB Hawaii Kaneohe Bay will have a total population just over 18,000, as shown in Table 2-1. This includes the arrival of two MV-22B squadrons, the departure of 3 Navy P-3 squadrons, and the arrival of a rotational Navy P-8 detachment. This population is spread throughout the base districts.

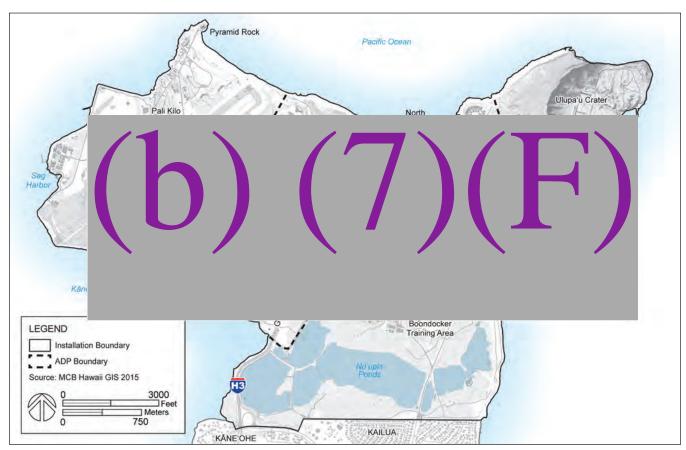


Figure 1-1 **District Location**

Table 2-1 **Projected FY18 Force Loading for MCB Hawaii Kaneohe Bay**

OFFICER ¹	ENLISTED ¹	CIVILIAN1	DEPENDENT ²	TOTAL
746	7,288	682	9,871	18,587

¹ Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY12 Facilities Support Requirements document, FY12 Navy Manpower Report, and FY18 projected Tables of Organization. Unit Deployed Program (UDP) personnel have been subtracted from these numbers.

2.1.2 Community Support District

The population within the Community Support District includes a residential component and daily employees who work within the district. Active duty personnel and their dependents living in base family housing are the largest base loading component within the district. Collectively, the approximately 2,400 family housing units are at a 95 percent occupancy rate, with a 300-family waiting list. They also are available to bachelors and families in other Department of Defense (DoD) services not stationed at MCB Hawaii.

The Community Support District is a major job center for hundreds of employees who work for a wide variety of Marine Corps Community Services (MCCS) operations, the Marine Corps Exchange (MCX), the commissary, other retail venders, and family housing support services. While some of these employees may live within the district, the vast majority live off base.

2.2 Area Equipment Loading

There is no appreciable equipment loading in the Community Support District.

2.3 Facility Requirements

Basic Facility Requirements for the Community Support District were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies in the Community Support District are presented in Table 2-2.

² Dependent personnel numbers have been derived using December 2012 Defense Manpower Data Center reports. Includes UDP personnel and their dependents.

Table 2-2 **Community Support District Facility Requirements** (CCN 53045–CCN 75110)

	(
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
53045	Veterinary Treatment Facility	SF	2,622	2,622	0
72377	Troop Housing Storage	SF	9,442	9,293	(149)
72414	Bachelor Officers Quarters Transient W3-W5 and 03&UP	PN	65	85	20
73055	Dependent School—Grade School	SF	0	109,502	109,502
73083	Religious Ministry Facilities	SF	40,170	23,289	(16,881)
73085	Post Office	SF	8,250	6,972	(1,278)
74001	Exchange Retail Store	SF	79,540	80,945	1,405
74004	Exchange/MWR Food Service	SF	26,915	28,466	1,551
74009	Exchange Service Outlets	SF	39,586	19,791	(19,795)
74019	Credit Union	SF	8,750	8,750	0
74023	Commissary	SF	0	76,500	76,500
74030	Exchange Gas/Service and Auto Repair Station	SF	15,238	9,240	(5,998)
74032	Exchange Car Wash	SF	4,660	1,800	(2,860)
74047	Information, Tickets, and Travel Office	SF	1,410	1,202	(208)
74055	Youth (6-18 yrs) and School Age Children	SF	30,622	29,116	(1,506)
74060	Commissioned Officers' Club	SF	0	23,548	23,548
74070	Chief Petty Officers' Club	SF	0	3,053	3,053
74074	Child Development Center	SF	57,458	49,348	(8,110)
74080	Golf Clubhouse	SF	28,425	29,449	1,024
75040	Golf Course	НО	18	18	0
75056	Golf Driving Range	EA	1	1	0
75110	Community Playgrounds	EA	0	1	1

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

2.4 Developable Real Estate

During the planning process, areas throughout the 832-ac Community Support District were assessed for their ability to accommodate future development or redevelopment and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- Potentially Developable: Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Areas identified as Developable with Constraints include sites where existing facilities are outdated, in poor physical condition, or poorly sited. These sites provide opportunity for infill development. Infill development is the process of developing vacant or under-used parcels within areas that are already largely developed, and results in more compact development patterns, minimizes the need for new infrastructure (and may lower development costs due to proximity to existing infrastructure), and ensures that housing, work areas, and support services are close to one another. This approach supports MCB Hawaii's stated goals to create modern, efficient, and sustainable facilities and to consolidate functions. It also supports the goal of preserving land for training or recreational areas such as parks and greenspace. The potential availability of areas in the Community Support District for future development is shown on Figure 2-1.

2.5 District Assets

All 2,414 family housing units at MCB Hawaii Kaneohe Bay are located in the Community Support District. Family housing units are clustered in defined neighborhoods, and those on the slopes of Ulupa'u Crater have spectacular ocean and mountain views. Forest City currently manages all MCB Hawaii family housing under a public–private partnership (PPV), and is under agreement to sell their military communities portfolio to Hunt Companies with an expected management transition during the second quarter of FY16. A PPV Phase 6 lease agreement will redevelop the Hana Like neighborhood at a lower density (182 units compared to the 276 existing units), and construct 66 units in the Mololani neighborhood and 12 units in Wailuku neighborhood in the near-term. Table 2-3 summarizes existing family housing neighborhoods on the installation.

Major recreational assets in the district include the Officer's Club, a golf course and two beaches. The Kaneohe Klipper Golf Course is an ocean front, 18-hole, championship golf course with separate driving range, chipping green, and

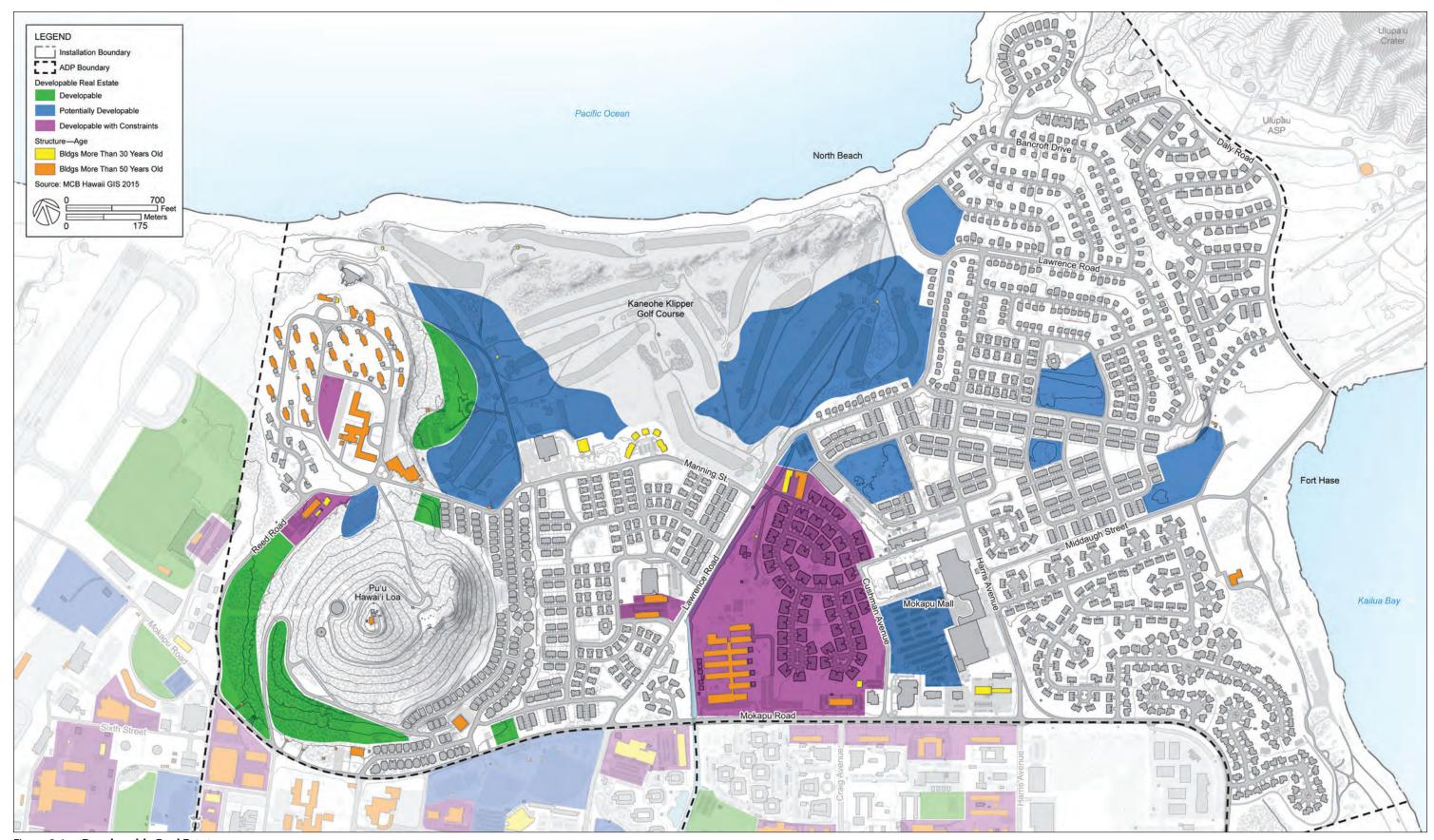


Figure 2-1 **Developable Real Estate**

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putting green. North Beach is a white sand beach just below the golf course and accessed through the Mololani neighborhood. It is popular location for swimming, surfing, diving, and fishing. Fort Hase beach, south of the family housing area and along the eastern shoreline, is also a popular fishing site. Fort Hase beach is used for landing Assault Amphibian Vehicles (AAVs) and is a designated craft landing zone. Landing zone Eagle is a large, open field adjacent to Fort Hase beach.

Mokapu Mall is the primary Marine Corps retail center on Oʻahu and includes a commissary, a MCX, retail stores, and a food court. The mall serves a large population that includes active duty service members, reservists, retirees, and dependents from all DoD services residing in nearby off-base communities.

Mokapu Elementary School is the only school located on MCB Hawaii Kaneohe Bay and is operated and maintained by the State of Hawai'i Department of Education. Originally built in 1960, the facility is outdated and undersized to serve the approximately 860 students in attendance. However, it remains a popular choice for families living on base primarily due to its convenient location. Major facilities and other landmarks are illustrated on the Community Support District Base Map (Figure 4-3) in Section 4.0, Base Maps.

Table 2-3 Number of Family Housing Units by Neighborhood

NEIGHBORHOOD	UNIT TYPE	ACRES	NUMBER OF UNITS	UNITS/ACRE
Hana Like	Multiplex	24.0	276	11.5
Hawaii Loa	Townhomes	25.6	237	9.3
Heleloa	Townhomes	19.8	23	1.2
Kaluapuni	Single Family	8.1	32	4
Kapoho	Townhomes	7.8	10	1.7
Mokolea	Single Family	7.0	17	2.4
Mololani	Single Family/Duplex	146.9	748	5.1
Nani Ulupau	Multiplex	6.5	40	6.2
Pa Honua I	Duplex	11.6	54	4.6
Pa Honua II	Townhomes	26.8	184	6.9
Pa Honua III	Townhomes	39.4	212	5.3
Ulupau	Duplex/Multiplex	33.5	218	6.5
Waikulu	Multiplex	47.3	363	7.4
Total		404.3	2,414	

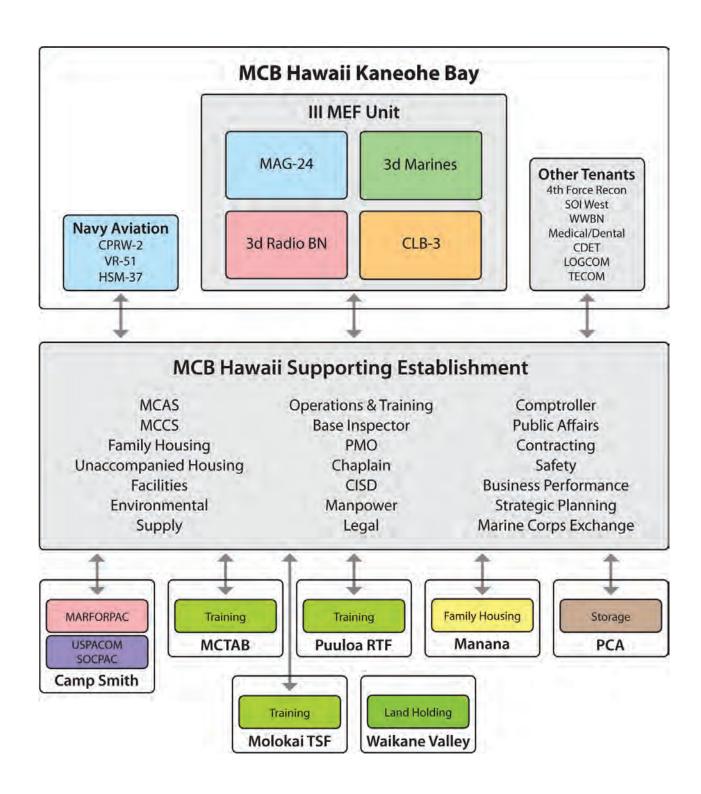


Figure 3-1 MCB Hawaii Functional Relationships

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3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii locations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawaii MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal Command Element functions/units do reside at various locations.

3.2 Community Support District

Figure 3-2 illustrates the functional relationships between major land uses within the Community Support District, which contains family housing, the Officers' Club, an elementary school, an exchange, a commissary, a chapel, child development centers, the 3rd Marines Regiment headquarters building, and some ground training facilities. Other Community Support-related uses and functions include playing fields, parks, playgrounds, transient billeting, and beaches.

Facilities that do not have a direct or related link to this district's main purpose should be considered for relocation to suitable districts, if economically feasible.

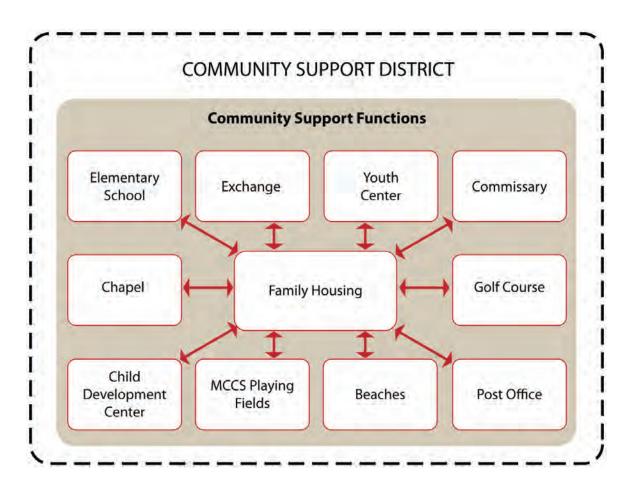


Figure 3-2 **Community Support District Functional Relationships**

4 Base Maps

Section 4, Base Maps, shows the Community Support District in the context of the neighboring windward Oʻahu community (Figure 4-1) and in relation to the other areas of MCB Hawaii Kaneohe Bay installation (Figure 4-2). Figure 4-3 highlights the major facilities and the physical geography of the district.

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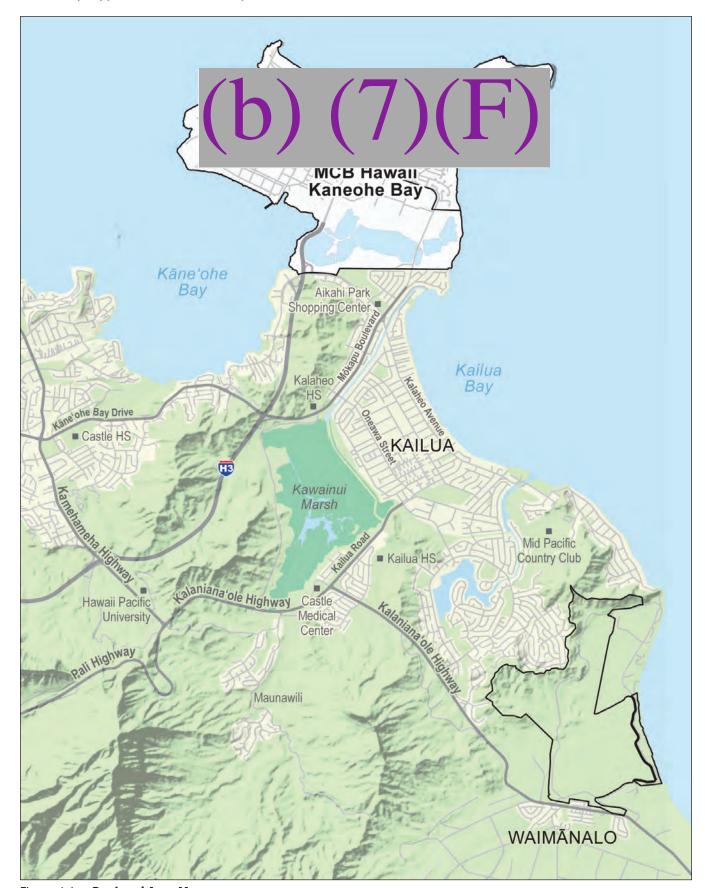


Figure 4-1 Regional Area Map

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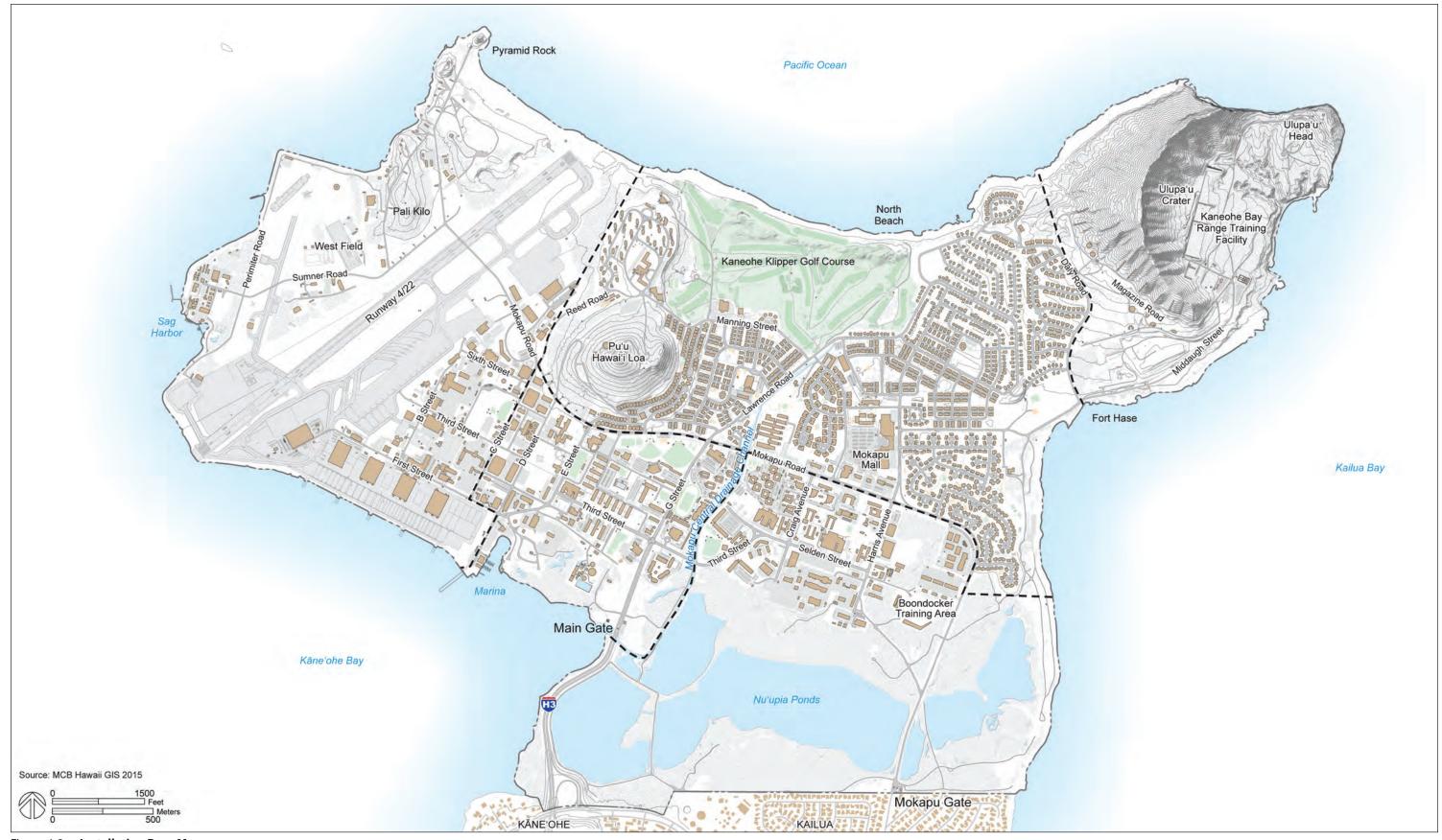


Figure 4-2 **Installation Base Map**

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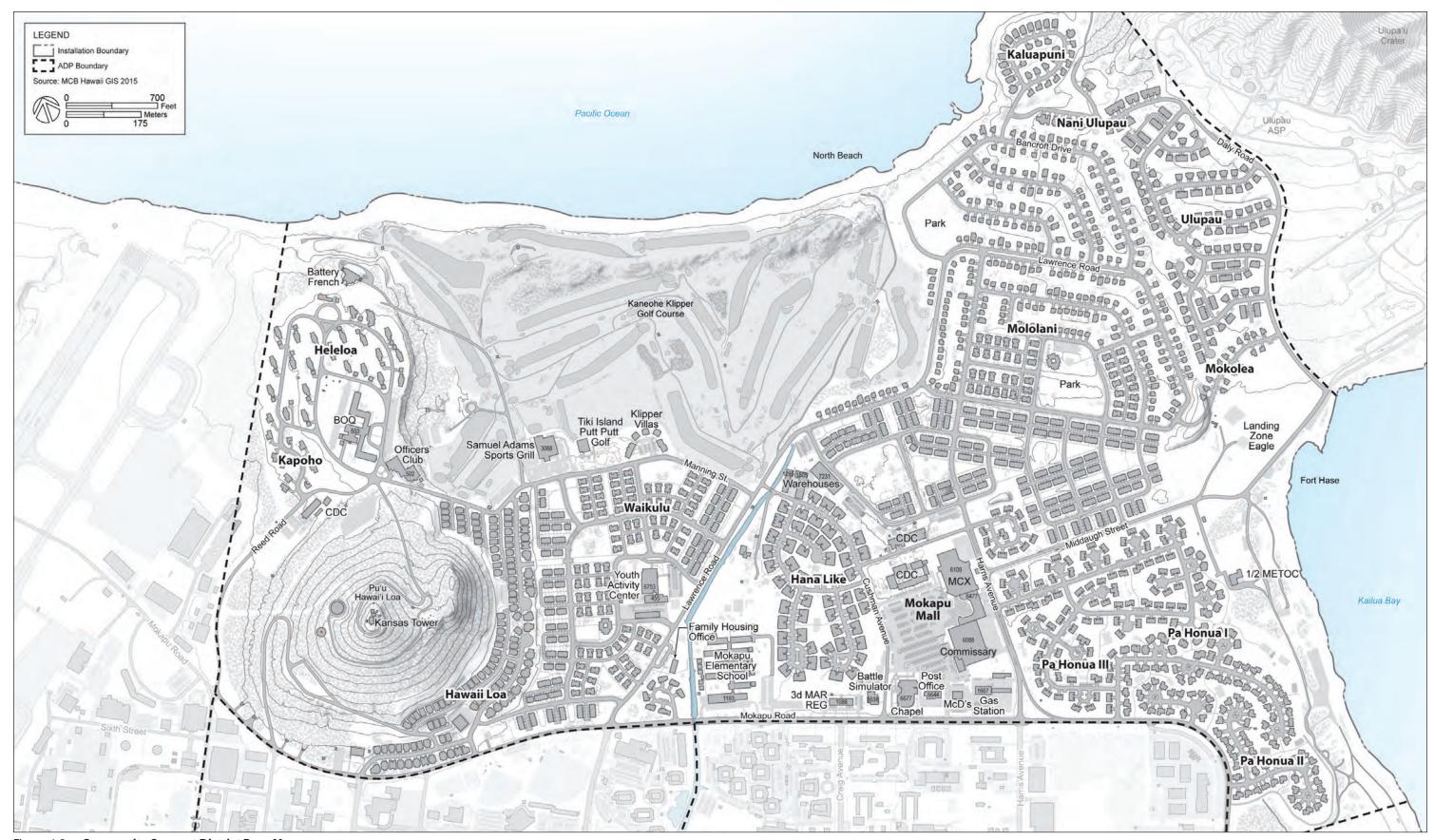


Figure 4-3 **Community Support District Base Map**



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5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and Geographic Information System (GIS) and facility databases were all primary information sources contributing to the development of the *Community Support District ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating in the district. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

Marine Corps Base Hawaii. Marine Corps Base Hawaii Kaneohe Bay Parking Study, Final Report. Prepared by Belt Collins Hawaii, Weslin Consulting. August 2014.

This parking study analyzed the installation's parking assets and requirements and identified areas with parking surpluses and deficits. Strategies were developed to provide for the growing need for parking.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities, and other planning documents and metrics.

U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The Optimization Study was prepared in response to an ongoing DoD process to evaluate the realignment of forces in the Pacific Region. The study identifies development opportunities that may be used to satisfy long-term requirements associated with relocation of units from Okinawa under the Defense Policy Review Initiative.

Community Support District stakeholders included representatives from the following units and departments.

MCB Hawaii Leadership and Administration

Marine Forces Pacific

Marine Corps Installation Command

Marine Corps Community Services

Marine Aircraft Group 24

Marine Aviation Logistics Squadron 24

Marine Wing Support Detachment

3d Marine Regiment

Combat Logistic Battalion 3

Marine Corps Air Station Kaneohe Bay (MCAS)

3d Radio Battalion

Commander, Patrol and Reconnaissance Wing 2

Wounded Warrior Battalion Detachment Hawaii

Operations & Training Department

Family Housing Department

Public Works Department

Facilities Department

Environmental Department

Supply Department

Communications Information Systems Directorate

21st Dental Company

Base Performance Office

Fuels Department

Energy Department

Base Safety Department

School Liaison Office

Naval Facilities Engineering Command Pacific

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Marine Corps Base Hawaii. Base Exterior Architectural Plan. Draft. December 2013.

The Base Exterior Architectural Plan presents both recommendations and guidelines to establish proper and consistent visual design of buildings and sites at MCB Hawaii Kaneohe Bay. The document analyzes existing base conditions and presents requirements and guidelines on site planning, landscape design, roadway design, architecture, and signage.

Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Utility System Capacity Study, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared by Helber Hastert & Fee Planners and HDR Engineering, Inc. October 2013.

The primary objective of this study was to determine the overall impacts of proposed military construction (MILCON) and non-appropriated funds projects in the flight line area on water and wastewater systems. The evaluation area was limited to the area bounded by D Street, Reed Road and the west boundary of the flight line area along Sumner Road and Perimeter Road. The study recommended water and wastewater improvement projects to upgrade and correct service deficiencies at the flight line.

U.S. Marine Corps Community Services. PVA for Main Exchange Renovation and Expansion, Marine Corps Base Hawaii Kaneohe Bay, Final Summary of Findings. Prepared by AECOM. September 2013.

This report is a Category 4 Project Validation Assessment and Level 3 Construction Cost Estimate for the potential renovation/expansion of the MCX building (Building 6109) at MCB Hawaii Kaneohe Bay. The recommended alternative includes expansion of the Main Exchange and consolidation of all exchange services in the expanded facility.

Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. May 2013.

This environmental assessment (EA), prepared in accordance with the National Environmental Policy Act, evaluates a proposal to provide suitable sites on DoD installations in Hawai'i to a private entity for the installation and operation of photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on DoD installations on O'ahu and Kaua'i.

Marine Corps Base Hawaii and Naval Facilities Engineering Command, Hawaii Division. Bicycle Route Planning Study for Marine Corps Base Hawaii Kaneohe Bay. Prepared by Belt Collins Hawaii LLC et al. December 2012.

MCB Hawaii Kaneohe Bay seeks to encourage alternative modes of transportation within the base, particularly bicycling. This study included an extensive user survey, and identified and evaluated four alternative approaches to implementing a bikeway system to meet user demands and encourage ridership. The recommended alternative proposes a bikeway system using bike routes, bike lanes, bike paths, and shared use paths.

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Department of the Navy. Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i. Volumes I and II. June 2012.

This environmental impact statement assessed potential environmental impacts associated with the proposed basing of MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. The introduction of these aircraft in Hawai'i is part of the Marine Corps' plan to restructure and rebase its forces in the Pacific over the next 10 years.

Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

This plan provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

NAVFAC Pacific. Traffic Impact Report for the Marine Aviation Plan to Locate MV-22 and HMLA Squadrons at MCB Hawaii Kaneohe Bay, Kaneohe, Hawaii. Prepared by Julian Ng, Inc. September 2011.

This report looked at the traffic impacts of locating MV-22 and HMLA squadrons at MCB Hawaii Kaneohe Bay, which will increase the number of personnel on base. Recommendations for roadway improvements were identified to address existing and future traffic conditions, which are expected to be increasingly undesirable.

Naval Facilities Engineering Command (NAVFAC) Pacific. Electrical Utility System Assessment MCB Hawaii, Kaneohe, Hawaii. March 2011.

The purpose of this Electrical Utility System Assessment was to review the power requirements of future MILCON projects, and assess their impact on the MCB Hawaii Kaneohe Bay primary electrical distribution system. The entire system was surveyed and existing capacity, condition, and reliability were assessed.

Naval Facilities Engineering Command, Pacific Division. Air Installations Compatible Use Zones (AICUZ) Study Update, Marine Corps Base Hawaii Kaneohe Bay. Prepared by Wil Chee-Planning & Environmental. Final Draft. July 2009.

This is an update of the 2003 AICUZ study for MCAS Kaneohe Bay. It includes an updated noise study evaluating both baseline (2007) and future noise conditions (circa 2017). Future conditions reflect the proposed transition of aircraft at MCB Hawaii, specifically the replacement of the majority P-3 aircraft with P-8A, and replacement of three squadrons of CH-53D aircraft with one CH-53E and two squadrons of MV-22 Osprey tiltrotor aircraft. The AICUZ is a planning tool to ensure future planning actions are compatible with the anticipated noise environment.

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Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

This master plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

Hawaii Pacific Engineers. Mokapu Central Drainage Channel Study, Marine Corps Base Hawaii, Kaneohe Bay. Prepared by Hawaii Pacific Engineers. February 2002, revised March 2003.

This study is an assessment and refinement of a 1995 study of the Mokapu Central Drainage Channel, located in the central part of MCB Hawaii Kaneohe Bay. The channel conveys stormwater runoff in a north to south direction from the Kaneohe Klipper Golf Course through the base before discharging into Kāne'ohe Bay near the Nu'upia Ponds. Refinements included development of more accurate topographic data for the channel; developing channel flow rates at more frequent intervals corresponding to locations of actual inputs; and a hydraulic analysis at more frequent intervals along the channel, using the updated topographic and channel flow data. Based on the hydraulic analysis, recommendations were made for prioritizing drainage system improvements and estimated budgetary construction costs were provided.

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6 ADP Area Analysis

Section 6 presents the regional, offsite, and onsite conditions related to the Community Support District. Section 6.1, Regional Context, describes the neighboring civilian community. Section 6.2, Offsite Conditions, describes the general physical characteristics of MCB Hawaii Kaneohe Bay. Section 6.3, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resource constraints within the Community Support District. Plan alternatives for the Community Support District were developed and evaluated, and a recommended Area Development Plan is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Community Support District is located within the boundary of MCB Hawaii Kaneohe Bay, located on Mōkapu Peninsula on the windward side of Oʻahu. Mōkapu Peninsula is bordered by Kāneʻohe Bay on the west, Kailua Bay to the east, and the Pacific Ocean to the north. On its south side, MCB Hawaii Kaneohe Bay abuts civilian lands, including a residential neighborhood of Kailua town, a City and County of Honolulu wastewater treatment plant, and portions of Kāneʻohe town. The combined population of the Kāneʻohe/Kailua region is approximately 82,750 residents, with approximately 44,100 residing in Kāneʻohe and 38,650 residing in Kailua (U.S. Census 2010). Both Kailua and Kāneʻohe are primarily residential bedroom communities that include regional commercial, civil, and medical services.

Windward Oʻahu is separated from the more densely populated and urbanized city of Honolulu by the Koʻolau mountain range. Access to MCB Hawaii Kaneohe Bay from Honolulu is available via three highways that tunnel through the Koʻolau mountain range—the Likelike Highway 63, Pali Highway 61, and the John A. Burns H-3 Freeway. Oahu Transit Services provides county bus service to MCB Hawaii Kaneohe Bay. Regular off-base service is provided by Route 56 with multiple stops located within walking distance of the main and Mokapu gates. On-base service is provided by Route 70 five times daily between 0750 and 1400.

See Section 4, Figure 4-1, Regional Area Map, for a map showing the Community Support District in the context of windward O'ahu.

6.2 Offsite Conditions

This section describes the general physical characteristics of the entire MCB Hawaii Kaneohe Bay installation.

6.2.1 Geology

The Mōkapu Peninsula was formed by basaltic lava eruptions from four separate volcanic vents during the last period of volcanic activity on Oʻahu. Major volcanic features of the peninsula include Kūʻau or Pyramid Rock on the northwestern tip of the installation, Puʻu Hawaiʻi Loa in the central area, and Ulupaʻu Crater on the northeastern tip.

Following this volcanic activity, the peninsula was inundated by a rise in sea level, during which time an extensive coral reef was formed. As sea level retreated to its present level, beaches and sand dunes were formed from the deposition of calcareous sand by the prevailing tradewinds. Approximately 280 ac of coral fill were added to the peninsula's marshy central drainage basin between 1939 and 1941 to both deepen the sea channel for marine vessels and create a runway (Department of the Navy 2006).

6.2.2 Topography

Topography at MCB Hawaii Kaneohe Bay generally slopes towards the Nu'upia Ponds, with coastal areas sloping toward the shores. The three volcanic highpoints, Pyramid Rock, Pu'u Hawai'i Loa, and Ulupa'u Crater, are at elevations of approximately 75 ft, 330 ft, and 665 ft above mean sea level (msl), respectively.

6.2.3 Hydrology

The Mokapu Central Drainage Channel is a lined stream channel that runs through much of the base and empties into the Nu'upia Ponds Wildlife Management Area (WMA) and ultimately into Kāne'ohe Bay. Several watershed improvement projects have been conducted over the years in the vicinity of the drainage channel to remove invasive weeds and replace them with native plants. These wetland and watershed projects have increased stormwater retention capacity, reduced sedimentation into the Nu'upia Ponds and Kāne'ohe Bay, and improved water quality. The projects have also created a more aesthetically pleasing environment and improved habitat for native waterbirds.

There are approximately 131 ac of U.S. Army Corps of Engineers jurisdictional wetlands at MCB Hawaii Kaneohe Bay, covering five sites. The largest concentration of wetlands are in and around the Nu'upia Ponds WMA. Pockets of wetland are located within the Kaneohe Klipper Golf Course, next to the salvage Yard, and at West Field.

6.2.4 Soils

Soil types identified at MCB Hawaii Kaneohe Bay range from clay to fine beach sand and are shown on Figure 6-1. The majority of soils on the installation consist of well-drained soils developed from coral, lava, and/or alluvium, which provide a solid foundation for construction. Makalapa Clay (MdB, MdC), a prominent soil type around the slopes of Ulupa'u Crater, has high expansion and contraction potential that makes it poor for construction purposes. Soils associated with Rock Land (rRK) have similar expansion and contraction characteristics (Department of the Navy 2006).

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild trade winds, while winter has higher rainfall, cooler temperatures, and stronger trade winds. The predominant wind direction in the Hawaiian Island is from the east–northeast at 10 knots.

In the vicinity of MCB Hawaii Kaneohe Bay, the median annual rainfall is approximately 40 in. Monthly average low and high temperatures at MCB Hawaii Kaneohe Bay range from 76 to 85 degrees Fahrenheit in the warmest month (September) and from 69 to 79 degrees Fahrenheit during the coolest month (January).

6.2.6 Vegetation

Most of the developed land and open space MCB Hawaii Kaneohe Bay contains planted landscape material, typically Bermuda grass and a variety of native and non-native planted trees and shrubs. The non-managed dry land vegetated

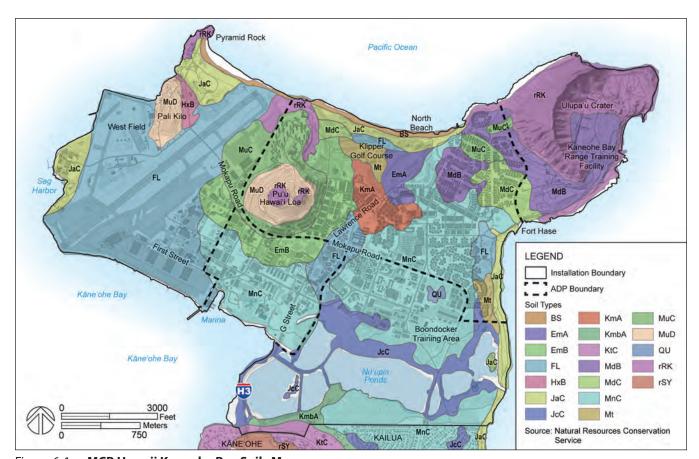


Figure 6-1 MCB Hawaii Kaneohe Bay Soils Map

areas, including around Pu'u Hawai'i Loa and Ulupa'u Crater, are dominated by non-native *koa haole* (*Leucanena leucocephala*) shrubland. Undeveloped shoreline areas include native sea strand vegetation.

According to the INRMP (2011), since 2008, natural resources staff have discovered several 'ōhai (Sesbania tomentosa) plants in the dune vegetation next to the shearwater colony on the Kailua Bay side of the installation. 'Ōhai is listed as a federal endangered species. The plants have been placed in custom built cages to protect them from rodents, and the area is monitored regularly by MCB Hawaii environmental staff. There are no other natural occurrences of plants currently listed or pending listing as endangered under the Federal Endangered Species Act (Marine Corps Base Hawaii 2011 and Department of the Navy 2006).

6.2.7 Wildlife Habitat

There are two designated WMAs at MCB Hawaii Kaneohe Bay: the 482-ac Nu'upia Ponds WMA and the 23-ac Ulupa'u Head WMA. The Nu'upia Ponds WMA provides habitat for endemic, endangered waterbirds, shorebirds, and seabirds, and provides refuge to 16 native fish species. The Ulupa'u Head WMA is one of two red-footed booby or ' \bar{A} (Sula sula rubripes) colonies in the main Hawaiian Islands. Although not a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many of the same waterbirds, shorebirds, and seabirds.

Endangered Hawaiian water bird species that feed and breed at MCB Hawaii Kaneohe Bay include the endemic Hawaiian duck or *koloa maoli (Anas wyvilliana)*, the endemic Hawaiian coot or *'alae ke'oke'o (Fulica americana alai)*, the endemic Hawaiian moorhen or *'alae 'ula (Gallinula chloropus sandvicensis)*, and the endemic Hawaiian stilt or *ae'o (Himantopus mexicanus knudseni)*. The Newell's shearwater or *'a'o (Puffinus auricularis)* is a federaly-listed threatened species that has been observed in the area. The endemic short-eared owl or *pueo (Asio flammeus sandwichensis)* is included on the state list of endangered species and has also been observed in the area.

The waters off MCB Hawaii Kaneohe Bay are home to four federal-listed endangered species of animals, including the endemic Hawaiian monk seal or 'ilio holo i ka uaua (Neomonachus schauinslandi), the sperm whale (Physeter catodon), the migratory humpback whale or koholā (Megaptera novaeangliae), and the migratory hawksbill sea turtle or 'ea (Eretmochelys imbricata). The green sea turtle or honu (Chelonia mydas) is a federal-listed threatened species that has been observed in the area (Marine Corps Base Hawaii 2011).

6.3 Onsite Conditions

The Community Support District primarily includes facilities that provide family housing, community support, and recreation for Marine Corps and Navy personal, their families, and other DoD personnel and retirees. The ocean-front Kaneohe Klipper Golf Course occupies much of the land in the district.

The golf course is surrounded on three sides by family housing clustered in identifiable communities. Community support facilities are generally located near the southern boundary of the district on or just off Mokapu Road, and include the commissary and exchange, Mokapu Elementary School, a two child development centers, a youth center, a post office, and a chapel.

6.3.1 Land Use

Figure 6-2 illustrates how family housing and community support functions dominate land use within the district. The limited non-community support uses include airfield support operations atop Pu'u Hawai'i Loa, a small warehouse area to support the golf course and Hunt Companies operations, and the 3d Marine Regiment headquarters and trainer facility. Lands within this district are under the control of the federal government and are not subject to any state or county land use controls or public access entitlements.

6.3.2 Transportation Network

Figure 6-3 illustrates the roadway network and major parking areas within the Community Support District. (b) (7)(F)

(b) (7)(F)

The section of Mokapu Road between Harris Avenue and Lawrence Road has 16 driveways within a half-mile span that provide access to major designations such as Mokapu Mall, Mokapu Elementary School, and primary billeting areas. Both the volume of traffic generated by these destinations and the frequency of driveways cause traffic congestion and safety issues, especially during rush hour and school drop-off/pick-up times.

The sidewalk and pathway network is well-developed and extends throughout the district to connect the family housing areas to the mall and other community support/recreation areas. Designating dedicated routes to Mokapu Elementary School with signage, colored striping, and continuing public awareness should encourage more children to access the school through this well-established path system.

The Marine Corps Base Hawaii Kaneohe Bay Parking Study (August 2014) identified a shortfall of approximately 280 stalls around the Mokapu Mall, 60 stalls at Mokapu Elementary School, and 35 stalls at the Officers' Club.

6.3.3 Utilities

This section provides an overview of the water, electrical, wastewater, storm drainage and communication systems at MCB Hawaii Kaneohe Bay and highlights utility issues specific to the Community Support District.



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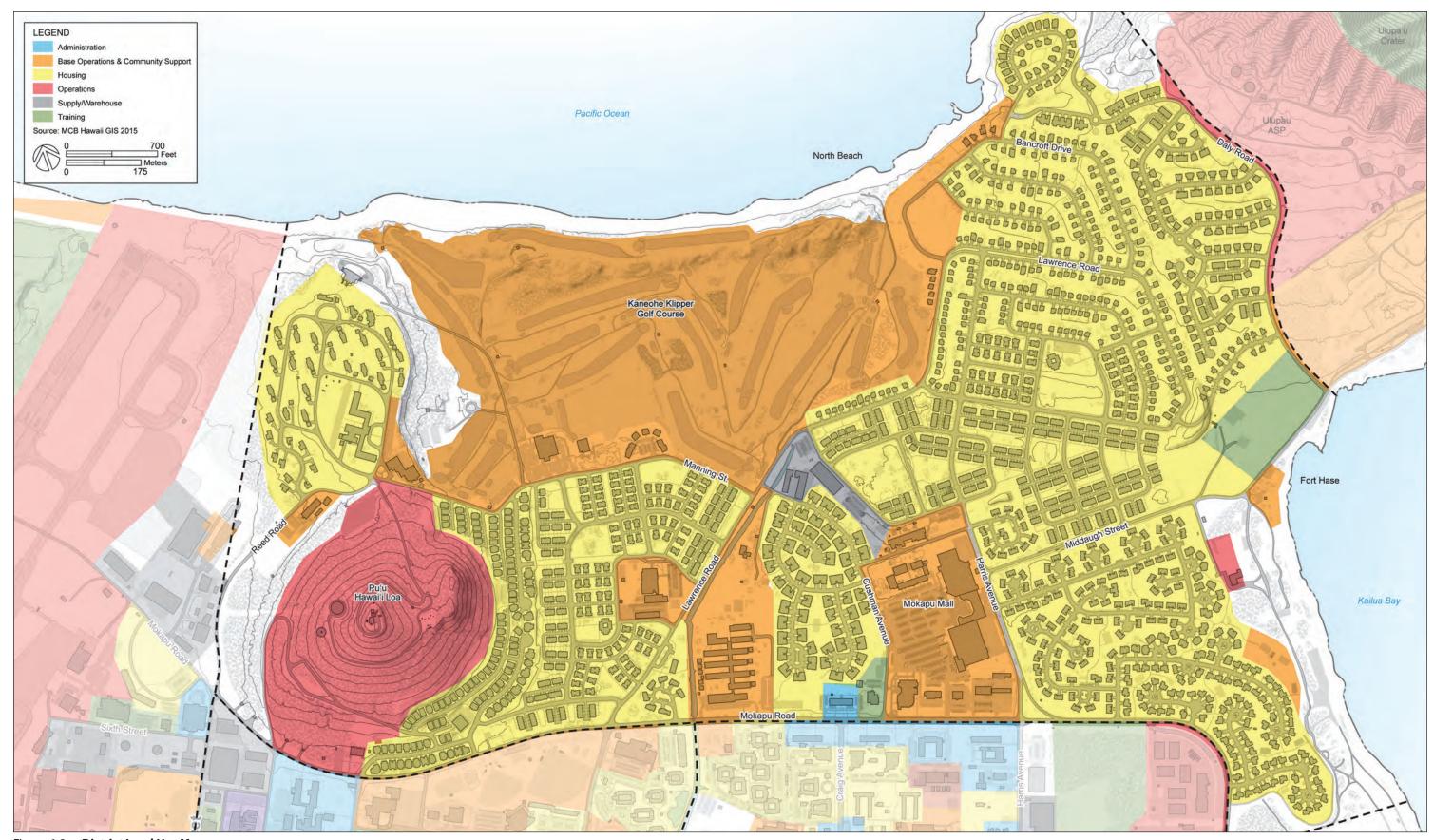


Figure 6-2 **District Land Use Map**

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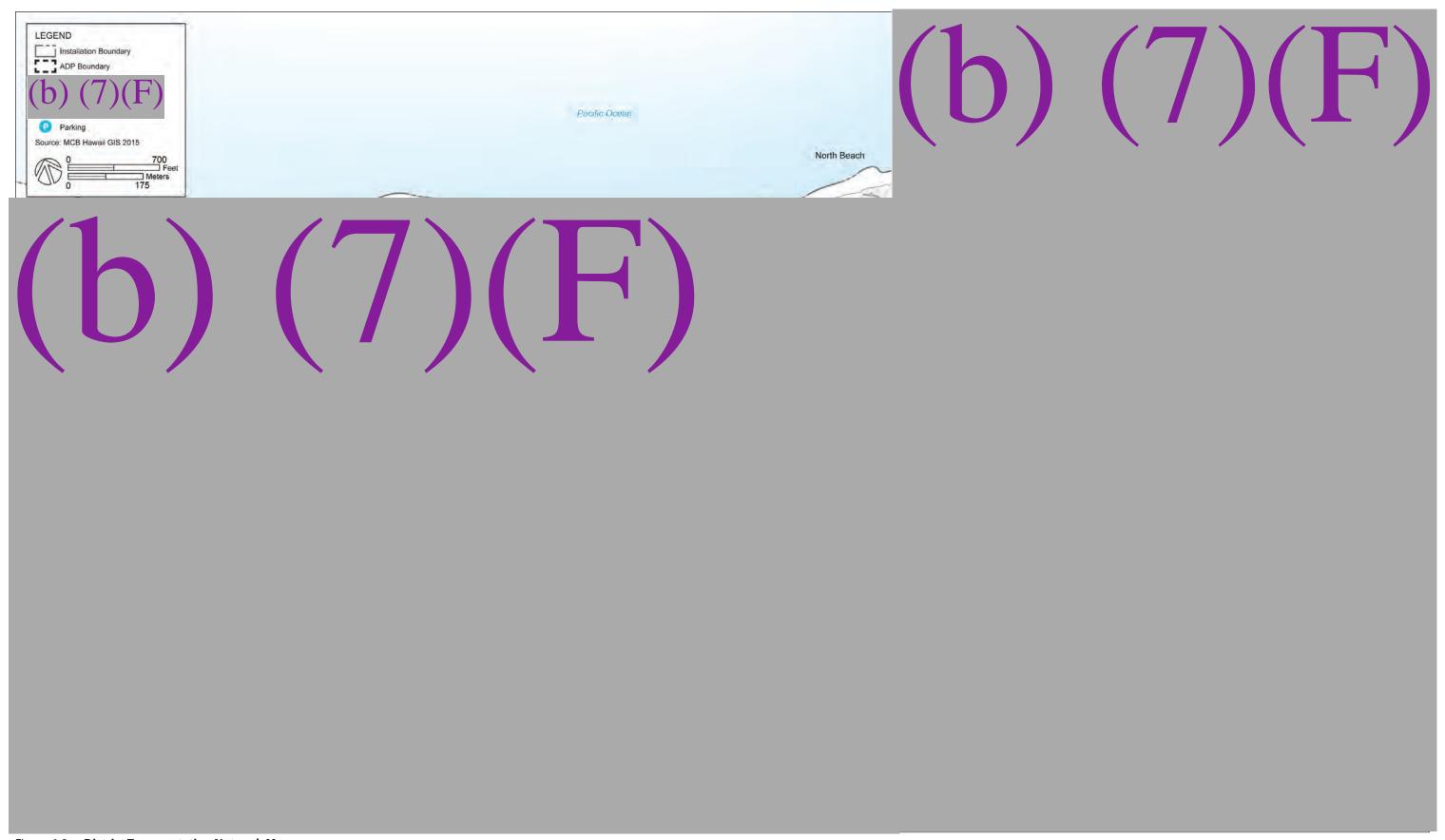


Figure 6-3 **District Transportation Network Map**

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Water System

Figure 6-4 illustrates the water distribution system in the Community Support District. In general, the water supply, distribution, and storage capacity at MCB Hawaii Kaneohe Bay is adequate for existing and future needs in the district. Future development along Reed Road will require extending the water distribution system.

The Community Support District is served by the MCB Hawaii Kaneohe Bay water system which is operated and maintained by the MCB Hawaii Facilities Department Maintenance Division. The potable water distribution system includes approximately 240,000 ft of water lines, two pump stations, five reservoirs (three of which are located with this district), altitude valves, sectional valves, service valves, pressure regulating valves, fire hydrants, water meters, and a chlorination and fluoridation facility. Water comes from the Honolulu Board of Water Supply (BWS)



BWS is under contract to provide 5,200 gallons per minute at 60 pounds per square inch (psi); however, actual service since 1999 has ranged from 100 to 110 psi. Daily water use measures approximately two-million gallons per day with adequate pressure for all existing general uses. (b) (7)(F)

The capacity of the transformer supporting this facility limits the number of pumps that can operate at the same time, thereby limiting the amount of water pressure the installation can organically generate. There are no potable water wells on MCB Hawaii Kaneohe Bay.

Wastewater System

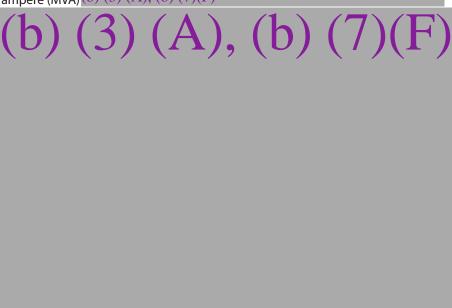
Figure 6-5 illustrates the wastewater collection system in the Community Support District. The wastewater collection system is generally adequate to support an increase in population, although future sewer line upgrades and pump station capacity upgrades may be necessary depending on the location. Future development located along Reed Road will require extending the wastewater collection system.

The MCB Hawaii wastewater collection system is operated by the MCB Hawaii Facilities Department. The wastewater collection system is comprised of approximately 920 manholes, 171,800 ft of gravity sewers and force mains, and 20 pump stations. Wastewater is collected and conveyed to the Water Reclamation Facility (WRF) located west of the main gate in the Base Support District. The WRF is a secondary biological treatment plant. MCB Hawaii seeks to upgrade the treatment and electrical systems of the plant in the near-term to provide redundant critical systems. Some treated R2-quality effluent is typically pumped to the Kaneohe Klipper Golf Course for irrigation while the rest is routed to the City and County of Honolulu Kailua Wastewater Treatment Plant for discharge

through the Mōkapu deep ocean outfall under a National Pollutant Discharge Elimination System permit from the State of Hawai'i Department of Health (HHF Planners 2013).

Electrical System

Figure 6-6 illustrates the electrical distribution system in the Community Support District. MCB Hawaii Kaneohe Bay is served from the 37.5 megavolt ampere (MVA) (b) (3) (A), (b) (7)(F)



In 2013, a final EA and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV in non-family housing areas in partnership with NAVFAC HI. Sites approved for PV installation in the Community Support District are also shown on Figure 6-6. Hunt Companies is seeking grid interconnection approval from HECO before they bring roof-mounted family housing systems online.

Communications Infrastructure

Communication infrastructure in the Community Support District is located in underground conduits. (b) (3) (A), (b) (7)(F)



Stormwater Management System

The MCB Hawaii Kaneohe Bay storm drainage system includes box culverts, drainage pipelines, and ditches, as shown on Figure 6-7. A portion of Kaneohe Klipper Golf Course serves as a stormwater retention basin that empties into the Mokapu Central Drainage Channel, as do eight other stormwater drains

in the district. The channel flows into the Nu'upia Ponds WMA and eventually discharges into Kāne'ohe Bay. There are no reports of significant flooding issues during storm events in the Community Support District.

Solid Waste Disposal

MCB Hawaii provides solid waste collection and disposal for administrative, industrial, military, commercial and bachelor quarters areas of MCB Hawaii Kaneohe Bay. Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupa'u Crater. Waste amounting to approximately 5,000 tons per year is placed in the landfill. At the present rate of waste generation, the landfill site should accommodate MCB Hawaii Kaneohe Bay's requirements for another 10–20 years, provided there are no changes in current regulations and cover material is readily available. However, the MCB Hawaii Environmental Department is currently conducting a study to evaluate permanently closing the landfill prior to it reaching capacity. A commercial contract service collects solid waste from PPV family housing areas for disposal at off-base facilities.

The MCB Hawaii Environmental Department operates a recycling center in Building 132 next to the marina. Traditional recyclables, wood pallets, and reusables from operational, maintenance, administrative, bachelor quarters, and community support areas are accumulated and processed for sale or for on-base reuse.

6.3.4 Environmental Conditions and Hazards

Figure 6-8 highlights specific environmental resources and hazards found in the Community Support District.

Stormwater Management and Flood Plain Areas

According to the Federal Emergency Management Agency the entirety of the developed area of the Community Support District is designated Flood Zone D, an area where flooding is possible but risk in undetermined. Within Flood Zone D, 10-year and 100-year flood hazard areas associated with the Kaneohe Klipper Golf Course stormwater retention basin and the Mokapu Central Drainage Channel have been identified (Department of Navy 2002, Rev. 2003). The Kailua Bay shoreline on the eastern edge of the district is susceptible to flooding from both storm surf (flood zone VE) and rainfall (flood zone AE). Eighty-four Pa Honua II housing units are located within the AE zone.

Wetland

Although not part of a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many waterbirds, shorebirds, and seabirds.

Wildlife Habitat

Although not part of a designated WMA, the shorelines of the Community Support District provide habitat for shorebirds, the Hawaiian green turtle or honu (Chelonia mydas), and the Hawaiian monk seal or 'ilio holo i ka uaua (Neomonachus schauinslandi).

Installation Restoration Program Sites

The 4.7-ac Motor Transport Disposal B site is located beneath the Kupulau CDC and a portion of the MCX and is listed as active and requiring further remediation.

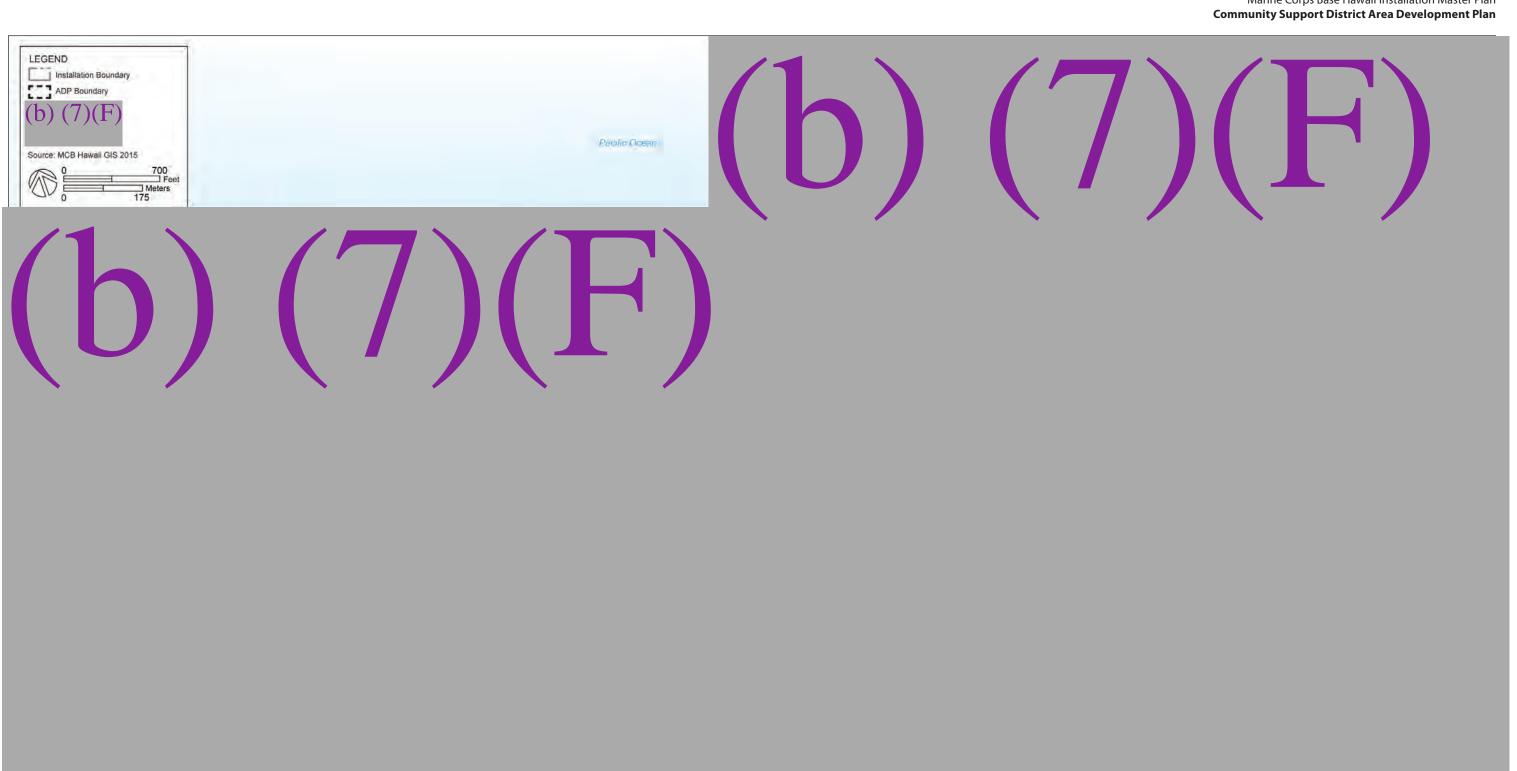


Figure 6-4 **District Water System**

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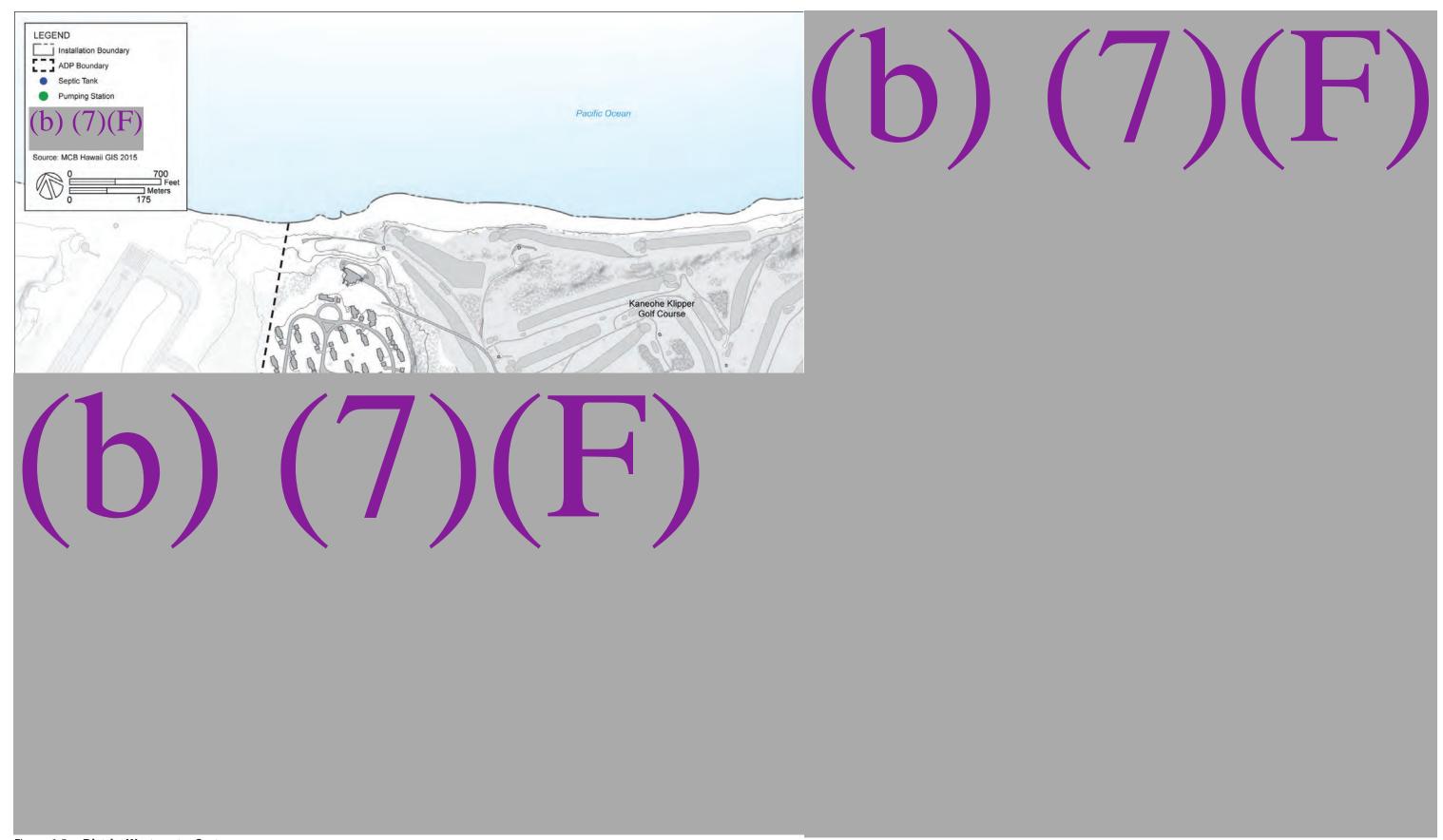


Figure 6-5 **District Wastewater System**

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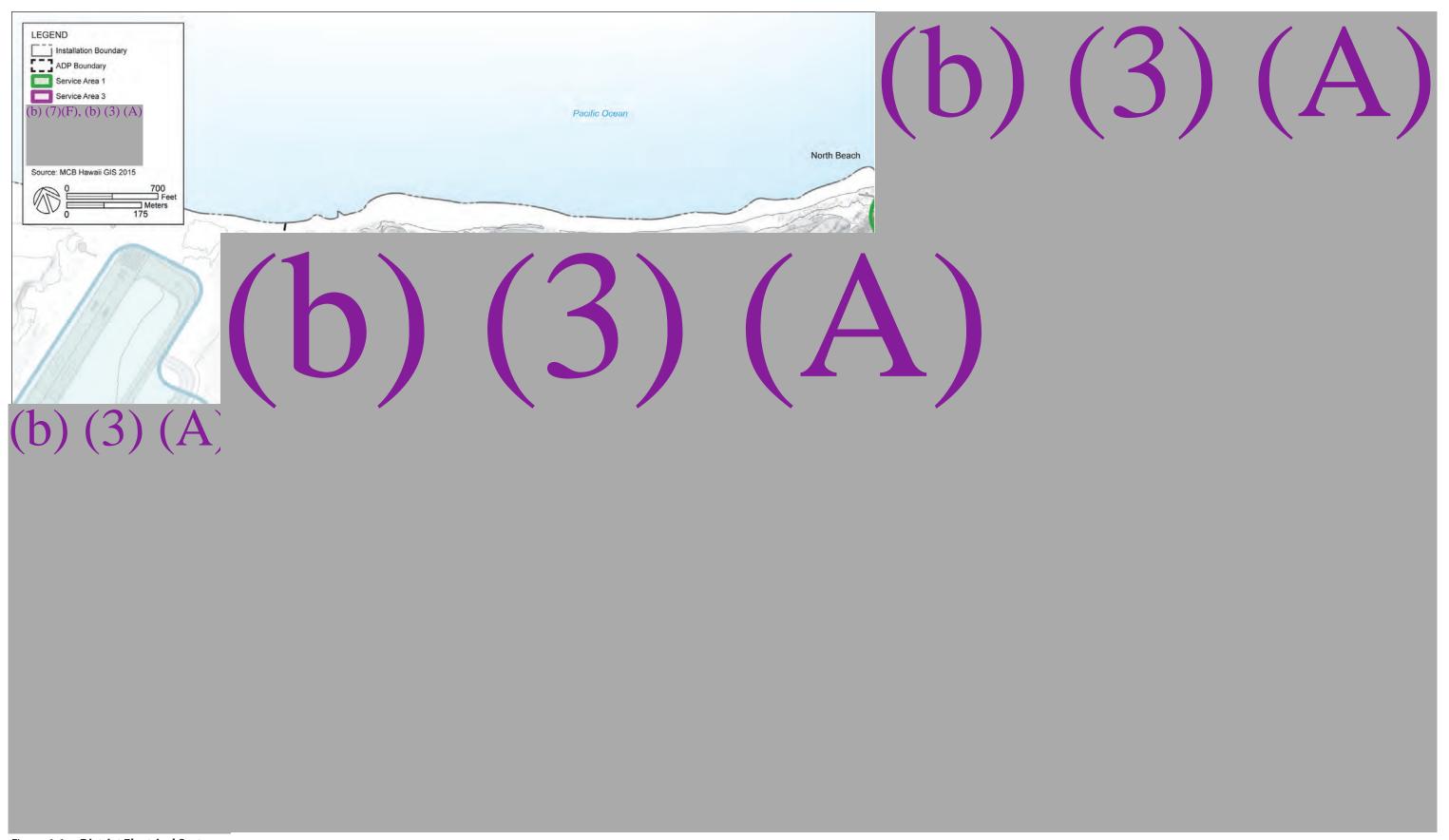


Figure 6-6 **District Electrical System**

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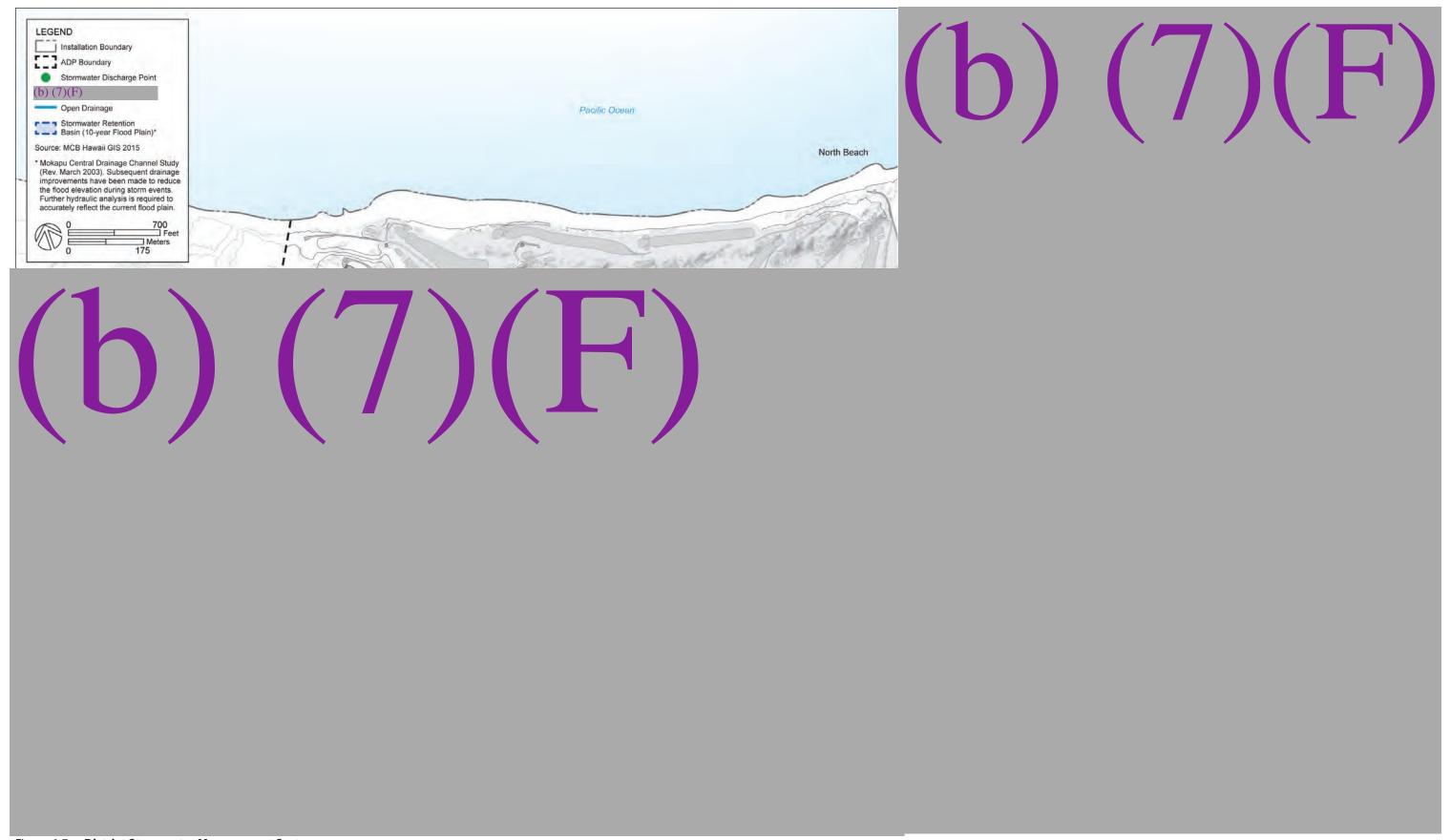


Figure 6-7 **District Stormwater Management System**

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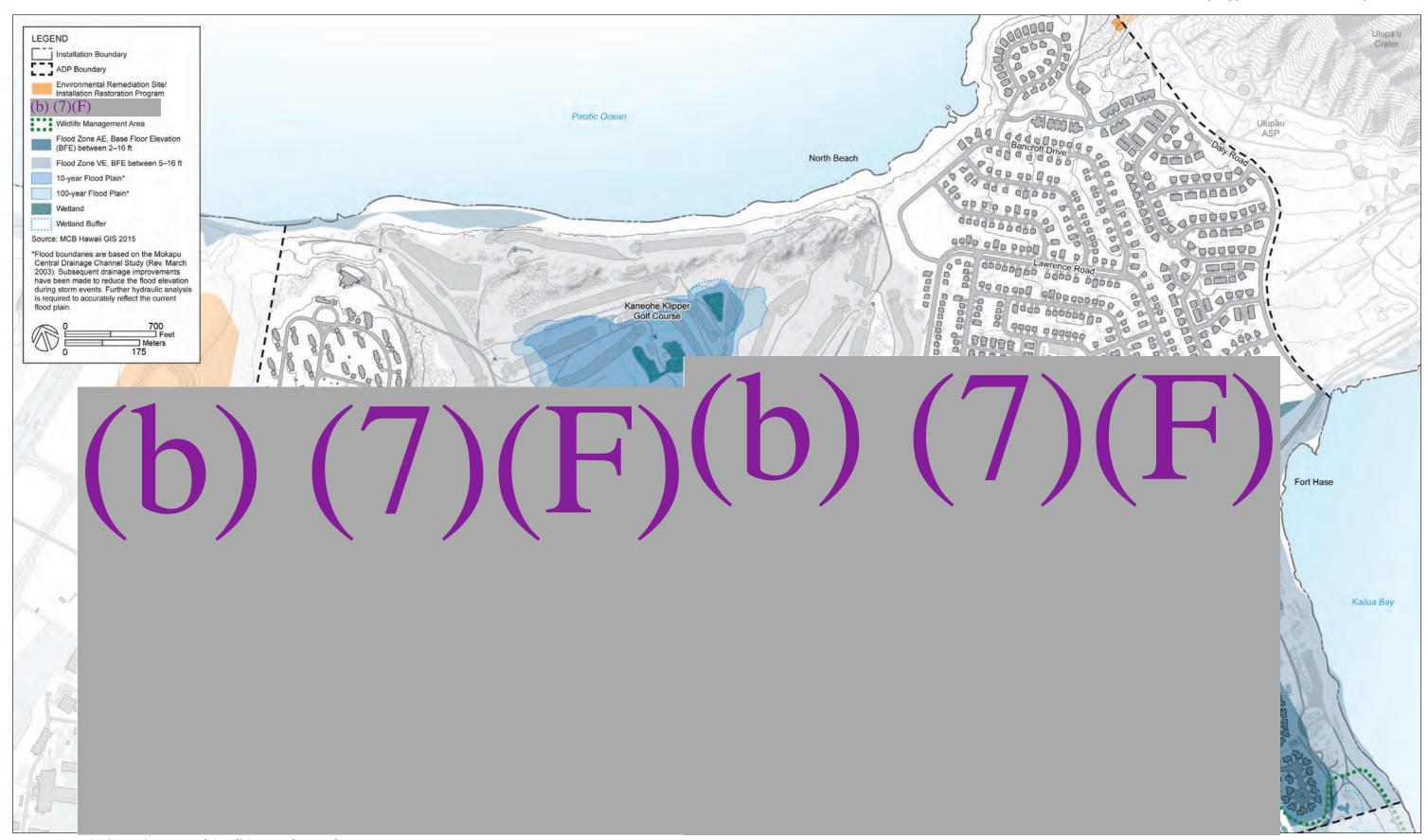


Figure 6-8 **District Environmental Conditions and Hazards**

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6.3.5 Archaeological and Historic Architectural Resources

Archaeological Resources

A major pre-contact archaeological site along the northern coast of the Aviation District is the Mōkapu Burial Area (Site 50-80-11-1017), which was listed on the National Register of Historic Places (NRHP) in 1972. The Mōkapu Burial Area encompasses most of the northern shoreline of MCB Hawaii Kaneohe Bay, extending approximately 0.9 mi from Pyramid Rock on the west to the base of Ulupa'u Crater on the east. An inventory of Native Hawaiian remains from the area identified at least 1,582 distinct individuals which have been repatriated although not reburied (Department of the Navy 2014). The NRHP nomination form describes the site as having "provided the best source of scientific data on noncave burials in all of Hawaii."

Historic Architectural Resources

MCB Hawaii Kaneohe Bay has three NRHP eligible historic districts that contain World War II historic facilities. One of these, the "Historic Officers' Housing District," is located within the Community Support District and encompasses the existing Heleloa family housing neighborhood. The location of this NRHP eligible historic district and facilities are shown on Figure 6-9. This historic district has been recommended as eligible for listing on the NRHP under Criterion A, having association with "events that have made a significant contribution to the broad patterns of our history."

The following description is from the district's NRHP nomination form. (Department of the Navy 2014, pg. II–58)

The Historic Officers' Housing District at Heleloa includes 27 facilities built as the initial officers' bachelor and family housing. It includes the Commanding Officer's Quarters, Commissioned Officers' Quarters, and Bachelor Officers' Quarters, as well as an underground bunker, storage facility, and boiler plant.

The area retains the spatial plan, the associations between the facilities, and the general landscaping of the historic NAS Kaneohe as completed in 1941. The neighborhood was designed with curvilinear streets, ample green space between buildings, and irregular siting of the residences to capture the magnificent views of the ocean. It is the only neighborhood of housing remaining from this period.

Twenty-three of the 27 historic housing units were recorded and rehabilitated under the Public/Private Venture (PPV) housing program. HABS documentation included a sketch plan of each unit, historical research, and large-format photography of character-defining interior features and exterior views of the neighborhood. The existing street layout was retained for 27 replacement housing units.

6.3.6 Safety Hazards

The Community Support District is adjacent to the airfield to the west and live fire training ranges to the east. Areas impacted by the safety zones from these activities are illustrated on Figure 6-10. A portion of the Heleloa family housing neighborhood, situated overlooking the airfield, is within Noise Zone 2—areas exposed to 65 to 79 dB day-night average sound levels (DNL). Residential uses with in this zone is discouraged, although impacts can be mitigated with window treatments, screening (vegetation and berms), and building siting. A surface danger zone (SDZ) from a small-arms live fire training range in Ulupa'u Crater encumbers portions of family housing in the Pa Honua I and II neighborhoods.

6.3.7 AT/FP Physical Security

Within the boundary of the installation, antiterrorism/force protection (AT/FP) guidelines dictate separation distances between roadways and buildings, which can affect building orientation, setbacks from roadways and parking areas, adjacencies between buildings, and construction types. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-1*, *Installation Master Planning* (May 2012). Figure 6-11 shows lands in the Community Support District encumbered by the standoff distances for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries. (b) (7)(F)

(b)
$$(7)(F)$$

The Community Support District fronts the waters of Kailua bay on the east and Pacific Ocean on the north. Access to all waters surrounding Mōkapu Peninsula are subject to a 500-yard security buffer due to its designation as a Naval Defensive Sea Area.

6.3.8 Sources of Air, Noise, and Light Pollution

There are no reported sources of air pollution in the Community Support District. Night time light sources associated with urbanization are an ongoing concern for migratory seabirds. Noise pollution is discussed in Section 6.3.6, Safety Hazards.

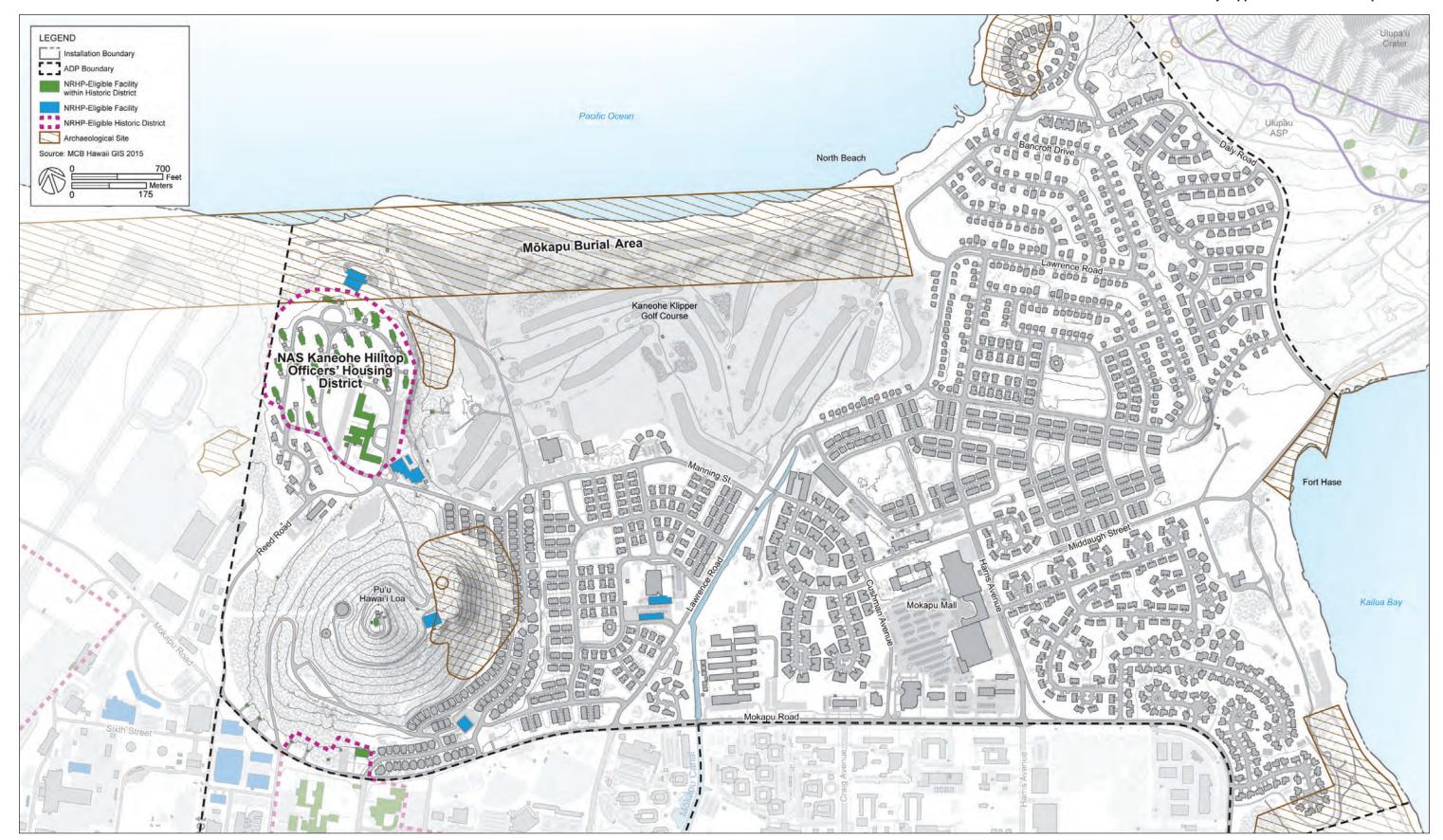


Figure 6-9 **District Archaeological and Historic Architectural Resources**

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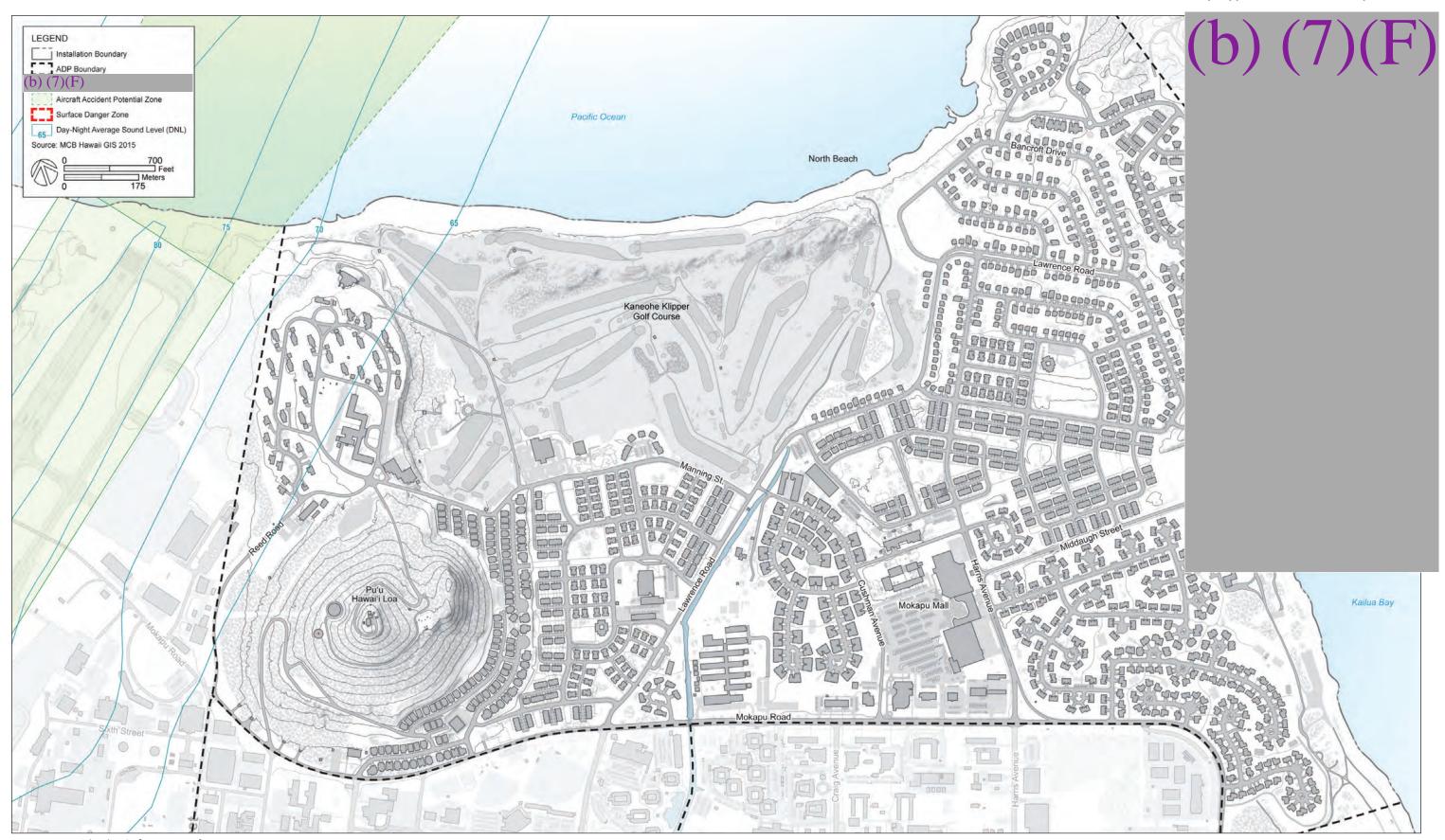


Figure 6-10 **District Safety Hazards**

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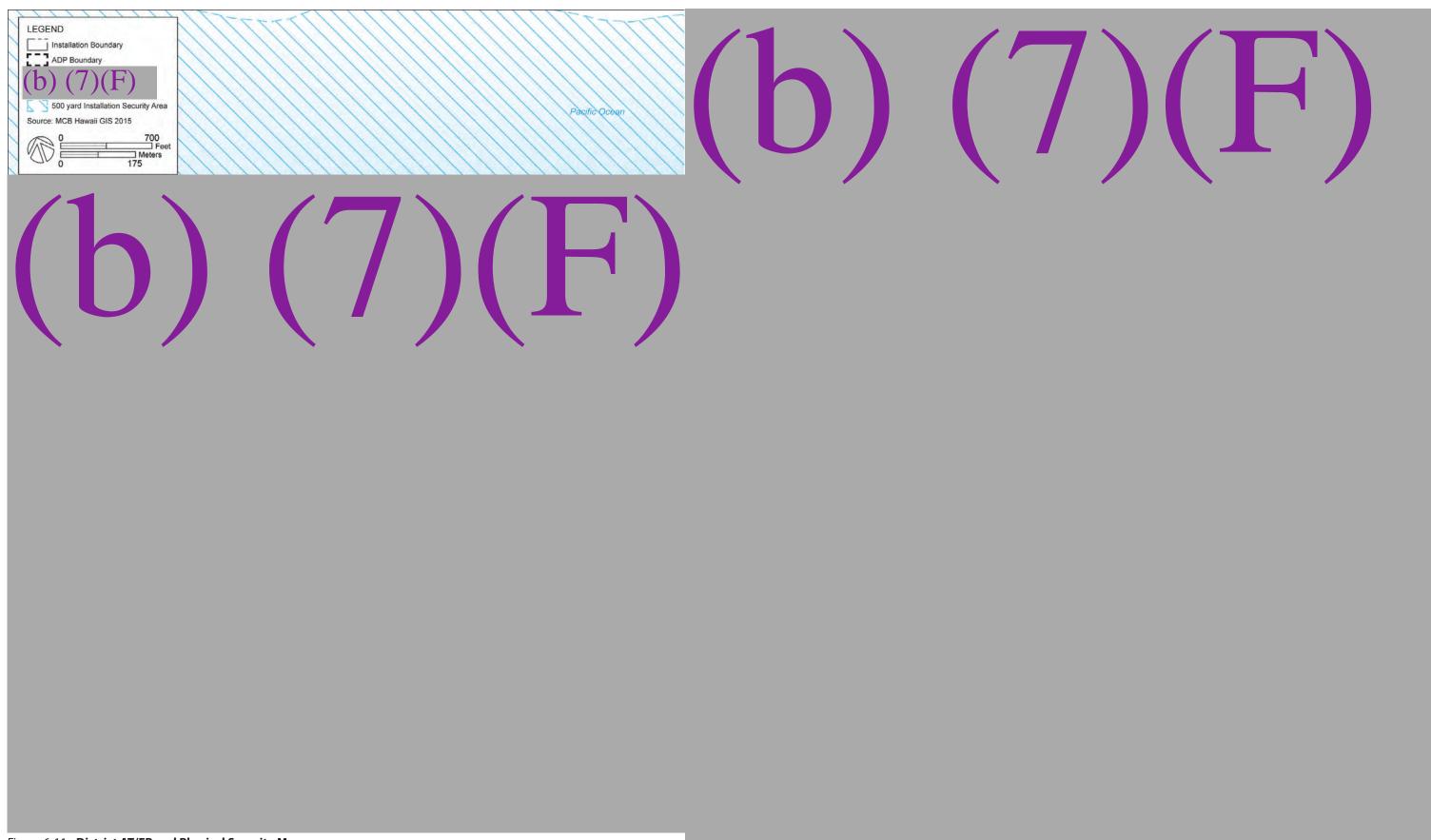


Figure 6-11 **District AT/FP and Physical Security Map**

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6.4 Alternative Site Development and Evaluation

Alternative site development plans were developed through a multi-step process involving key installation stakeholders, including representatives from MCB Hawaii departments, operational commands, and other supporting elements. A four-day charrette allowed participants to develop a variety of possible planning actions to address identified facility and land use issues in the Community Support District including the following.

- Redeveloping Hana Like neighborhood for community support functions
- · Siting additional family housing units
- Improving vehicular and pedestrian network connections
- Siting a new elementary school at the existing or a different location
- · Reusing the youth center
- Siting a furniture shop (35,000 sf)
- Siting a MCCS distribution warehouse (30,000 sf)
- Siting a satellite fitness center (20,000 sf)
- Siting a community theater (17,200 sf)
- Siting a community library (20,000 sf)
- Siting a district parking structure
- Siting a transient quarters/temporary lodging facility
- · Improving waterfront amenities at beaches

These concepts were revised and presented as alternatives to stakeholders at a three-day Concept Workshop where they were further evaluated. The *Charrette Summary Report* (IMP Appendix A) and *Concept Workshop Report* (IMP Appendix B) thoroughly document the attendees, planning concepts, plan alternatives, and evaluation of the alternatives during the plan development process. Subsequent to the Concept Workshop, a revised, preferred alternative for the Community Support District was presented to MCB Hawaii leadership and is reflected in the ADP presented in Section 6.5.

Concurrent to the IMP planning process were separate efforts to redevelop the Hana Like neighborhood under a Hunt Companies lease agreement (Hawaii PPV Phase 6) and the State of Hawai'i Department of Education exploring the renovation or redevelopment of Mokapu Elementary School with funding coming from a federal Office of Economic Adjustment grant. Both of these efforts have been informed by this planning effort although they are responding to separate schedules and developing plans in more detail than this district-level analysis can fully afford.

6.5 Area Development Plan

This section presents the ADP for the Community Support District at MCB Hawaii Kaneohe Bay. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific district-level goals and objectives. Future development envisioned for the Community Support District is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.5.1 Illustrative Plan

The Illustrative Plan graphically portrays planned, programmed, and recommended future development that supports the overarching planning goals for MCB Hawaii Kaneohe Bay. The Community Support District Illustrative Plan (Figure 6-12) presents a strategy to integrate the school into a neighborhood setting while maximizing family housing, increase retail activity at the Mokapu Mall, improve traffic safety and circulation, and provide ongoing support for existing recreational activities. Important plan features culminating from the IMP planning process are described in detail as follows.

Mokapu Mall Entrance and Traffic Improvements

Widen Cushman Avenue from 18 ft to 36 ft between Mokapu Road and a single Mokapu Mall entrance to allow for dedicated turning and receiving lanes for mall traffic. Relocate the southern Cushman Avenue mall entrance and designate it the primary and formal driveway in the surface lot. The north end of Cushman Avenue should be realigned to Manning Street at Lawrence Road to create a crossroad intersection. Create a new Harris Avenue driveway south of the commissary to provide a secondary access point and allow for the closure of vehicular traffic through the McDonald's parking lot off of Mokapu Road.

Mokapu Elementary School Redevelopment

Replace existing school through a phased redevelopment on the northern portion of the existing site to orient the facility towards family housing and away from the busy Mokapu Road thoroughfare. The existing site is centrally located to both family housing and the youth center, which is used for after school care. Access to the school by improving the existing service road to Building 5082 from the realigned Cushman Avenue. A new school facility would be a mix of single and two-story buildings to maximize available land. Mokapu Elementary School was constructed in 1960 and is deteriorating and undersized to meet current demand. The Department of Education lease on the current parcel expires is 2037; any changes to the number or location of ingress/egress points prior to expiration requires renegotiation.

Community Library

Construct a two-story 20,000-sf community library next to Mokapu Elementary School and in close proximity to family housing areas.

Community Theater

Relocate the base theater to a new 1,000-seat facility at Mokapu Mall fronting Cushman Avenue. Construct a two-story 420-stall parking structure to replace lost parking stall and address overall mall parking shortfall.

Multiuse Path

Develop a multiuse path alignment that connects the multiuse path terminus at the G Street and Mokapu Road intersection to MacLachlan Street. This segment connects family housing areas to the multiuse path network that extends throughout the Aviation, Base Support, and Ground Support Districts.

Golf Course Warehouse

Relocate golf course maintenance and cart warehouse to new 8,400-sf facility at the old tennis court site below Officers' Club. The existing warehouse site on Cushman Avenue should support additional PPV family housing or other community support functions, such as a park of amphitheater.

Beach Pavilions

Improve district beach park amenities, including a graded, permeably-paved parking lot and additional picnic pavilions at Fort Hase beach, and a restroom and shower facility at North Beach.

Land Reservation

The Community Support District ADP identifies 13.2 ac of land to support future infill development, including 2.6 ac fronting Mokapu Road available for future commercial or community support functions after the relocation of the 3d Marine Regiment headquarters to the Ground Support District.

6.5.2 Regulating Plan

The Regulating Plan, shown in Figure 6-13, provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum and maximum building heights (number of stories) to appropriately increase development density at MCB Hawaii Kaneohe Bay. The building height guidelines intend to maximize the development potential of the installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for the Community Support District continues the existing family housing, retail, community support, and recreation uses and identifies appropriate design characteristics and uses for infill development areas. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01*, *Installation Master Planning* (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)

- · Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)
- Medical Building Types (medical centers and clinics)
- Commercial Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, bowling alley and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.5.3 Circulation and Parking Plan

The overall goal of the Community Support District Circulation and Parking Plan, shown on Figure 6-14, is to improve vehicular flow and pedestrian safety, reduce the amount of surface parking while providing the required number of stalls, and increase walkability and bicycle riding throughout the district. A multiuse path alignment connecting MacLachlan Street to the pathway network at the G Street and Mokapu Road intersection and will provide access to a complete pedestrian and bicycle network across the installation. Bike shelters are shown along the path at the redeveloped elementary school.

Improvements to Cushman Avenue are intended to create a formal mall entrance that consolidates and channels traffic in the parking area, and allows for the current McDonald's access point to be closed, ultimately reducing the number of major driveways along Mokapu Road. A secondary mall driveway on Harris Avenue will provide convenient access to family housing areas and customers entering the base through the Mokapu gate. In addition, a parking structure is recommended to meet existing and future privately-owned vehicle parking requirements at the Mokapu Mall.



Figure 6-12 Community Support District Illustrative Plan

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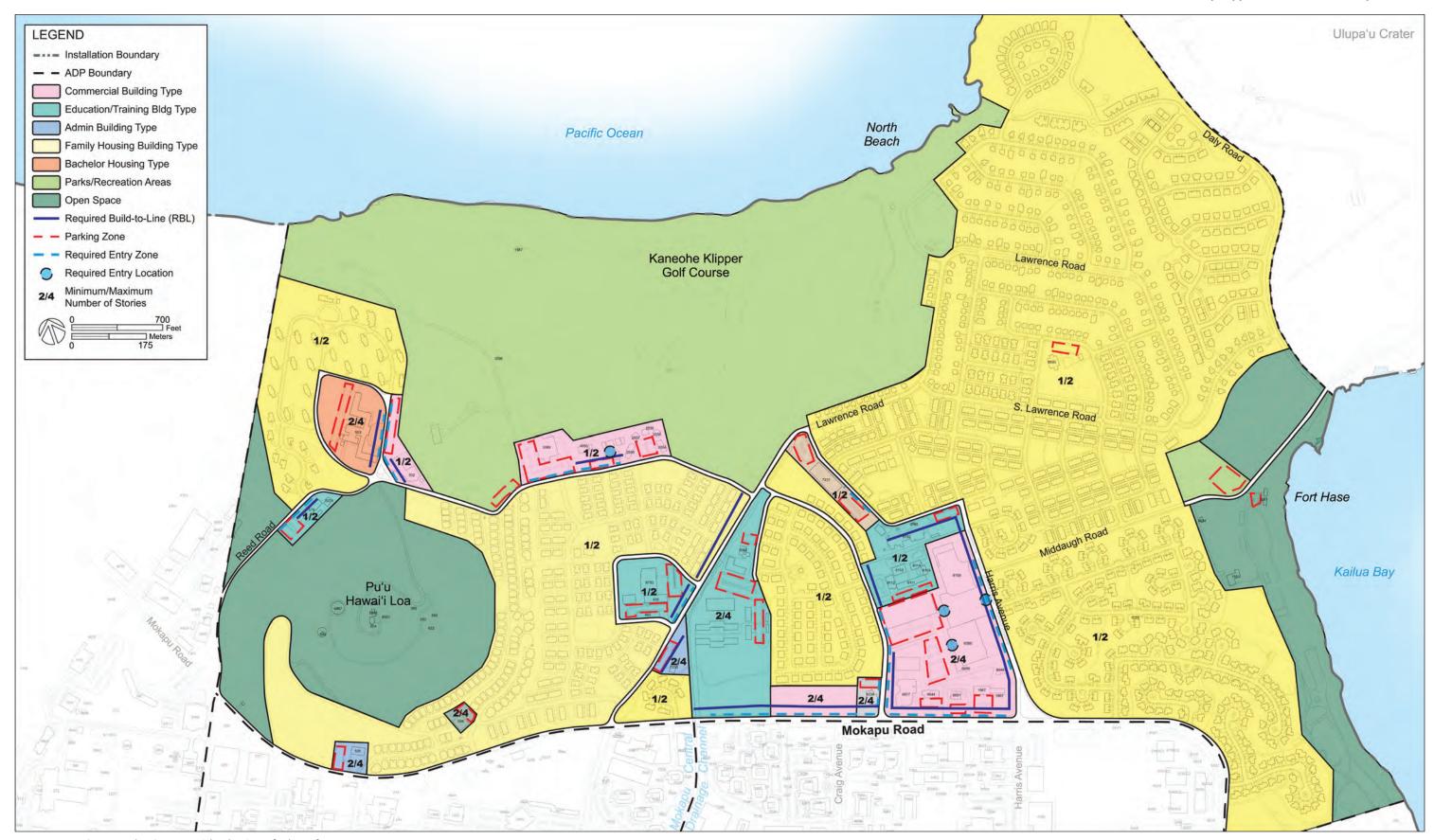


Figure 6-13 Community Support District Regulating Plan

FOR OFFICIAL USE ONLY

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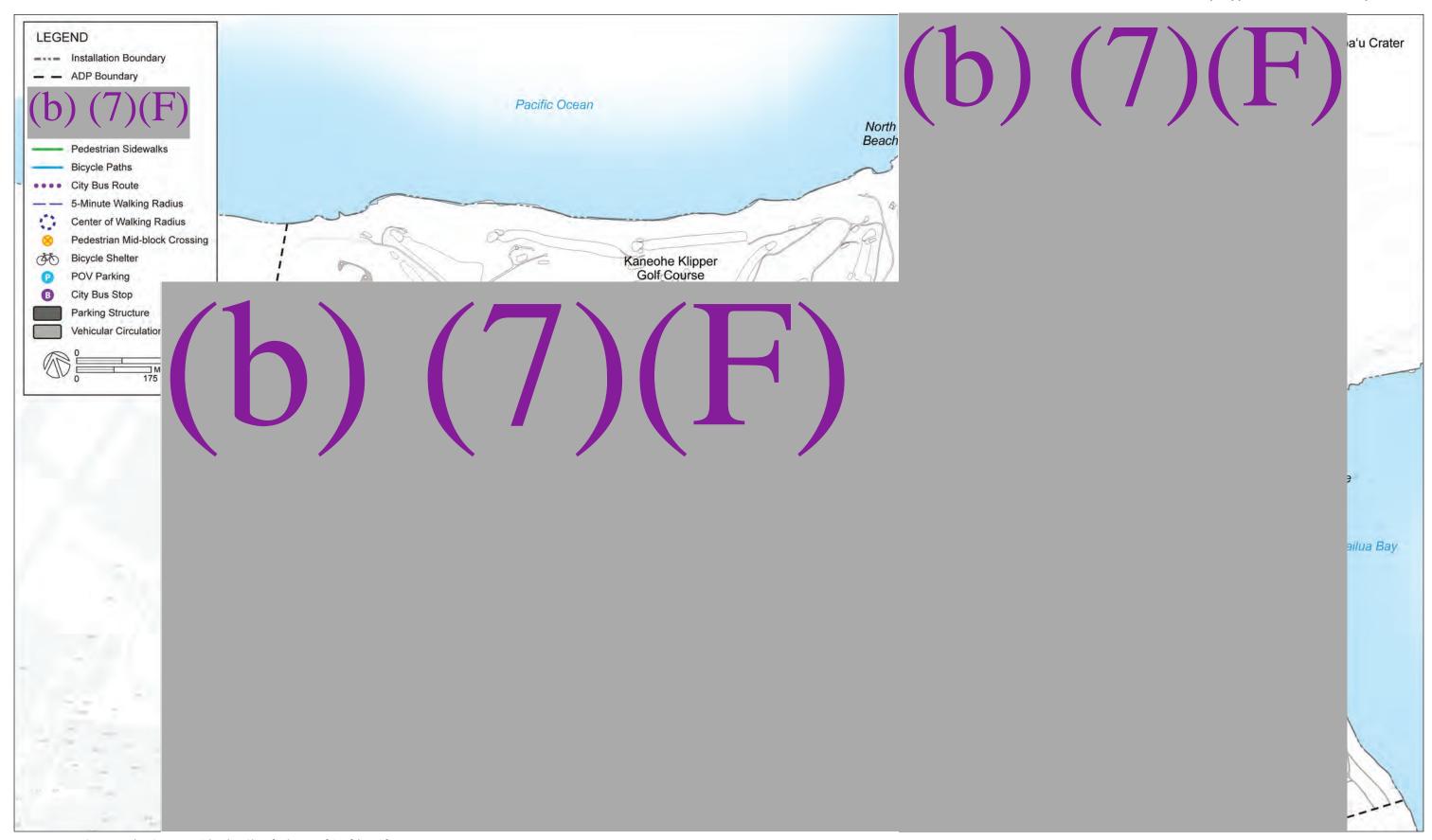


Figure 6-14 Community Support District Circulation and Parking Plan

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7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Community Support District ADP* presented in the context of the installation's existing CIP. The plan is presented graphically on Figure 7-1 and detailed in Table 7-1, which describes each planning action, including any required demolition or other dependent actions.

The timeframe of each planning action is classified as short-term, midterm, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions consist primarily of existing projects developed as part of the installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D. Modifications to the scope of existing projects are noted and list an updated ROM cost where appropriate.

Table 7-1 **Summary of Proposed Development Actions** (Map ID 1–14)

lable 7-1 Summary of Proposed Development Actions (Map ID 1–14)					
MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE & DESCRIPTION	ROM COST (\$K)	
1	Short-term FY14 CCD 12/16	P-884	Playing Field Replacement Constructs playing fields to replace facilities impacted by new aviation simulators	(b) (5)	
2	Short-term FY15 EAD 9/15	P-924	MV-22 EIS Traffic Improvements Mokapu roadway improvements		
3	Short-term FY16	Proposed	 PPV Phase 6 Family Housing Demolish 276 Hana Like family housing units Construct 182 units at Hana Like, 66 units at Mololani, and 12 units at Waikulu neighborhoods 		
4	Mid-term	P-930	Fire Station • MCCS dance studio rebuilt in Community Support District		
5	Mid-term	Proposed	Mokapu Elementary School Redevelop school Connect through 802 housing neighborhood		
6	Mid-term	P-813	Klipper Villa Expansion Construct new 24-unit temporary lodging facility on site of Tiki-Tiki Putt-Putt golf course		
7	Long-term	Proposed	MCX Exchange Expansion Renovate and expand Mokapu Mall		
8	Long-term	Proposed	Mokapu Mall Entrance and Traffic Improvements Widen southern portion of Cushman Avenue fronting Mokapu Mall to 36 ft New Harris Avenue driveway to commissary parking lot Close existing commissary parking entry via McDonald's lot		
9	Long-term	Proposed	 Golf Course Warehouse Construct new 8,400-sf warehouse Convert existing site for PPV family housing May require asbestos abatement for buried tennis court material 		
10	Long-term	Proposed	Multiuse Path Extension - Segment extends G Street path to Hana Like neighborhood (west end of Malabey Street)		
11	Long-term	Proposed	Community Library Construct two-story, 20,000-sf community library adjacent to new elementary school and family housing		
12	Long-term	Proposed	Community Theater Construct new 1,000-seat multipurpose theater Construct 420-stall two-story parking structure		
13	Long-term	Proposed	Fort Hase Beach Improvements Formal entry with improved permeable parking lot New picnic pavilions		
14	Long-term	Proposed	North Beach Improvements Restroom and shower facility		



Figure 7-1 Community Support District Area Development Execution Plan

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7.2 Demolition Plan

Figure 7-2 highlights facilities proposed for demolition in the Community Support District. These facilities have either exceeded their economic life and require replacement, are excess and no longer need to meet facility requirements, or need to be demolished to support other development actions. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition** (Facilities 1088–2710)

Table 7-2 Summary of Proposed Demolition (Facilities 1088–2710)						
FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT		
1088	3d Marines Regimental HQ*	14,588	63	1953		
(b) $(7)(F)$						
1193	Mokapu Elementry School	98,842	56	1960		
1193-PT	School - Portable Bldg.	580	44	1972		
1193-P1	School - Portable Bldg.	1,120	44	1972		
1193-P2	School - Portable Bldg.	1,120	44	1972		
1193-P3	School - Portable Bldg.	1,120	44	1972		
1193-P4	School - Portable Bldg.	1,120	44	1972		
1193-P5	School - Portable Bldg.	1,120	44	1972		
1193-P6	School - Portable Bldg.	1,120	44	1972		
1193-P7	School - Portable Bldg.	1,120	44	1972		
1193-P9	School - Portable Bldg.	1,120	44	1972		
1193-P10	School - Portable Bldg.	1,120	44	1972		
1194	Sewage Lift Station	328	56	1960		
1295	Golf Course Maintenance Warehouse*	7,000	48	1968		
1505	Self Help Shop	10,000	74	1942		
1642	Training Pavilion	2,000	41	1975		
2700	Hana Like - Family Housing	9,230	24	1992		
2701	Hana Like - Family Housing	5,840	24	1992		
2702	Hana Like - Family Housing	9,230	24	1992		
2703	Hana Like - Family Housing	5,840	24	1992		
2704	Hana Like - Family Housing	5,840	24	1992		
2705	Hana Like - Family Housing	5,840	24	1992		
2706	Hana Like - Family Housing	9,230	24	1992		
2707	Hana Like - Family Housing	9,230	24	1992		
2708	Hana Like - Family Housing	5,840	24	1992		
2709	Hana Like - Family Housing	9,230	24	1992		
2710	Hana Like - Family Housing	5,840	24	1992		

^{*} Denotes a facility encumbered by an existing NAVFAC Energy Savings Performance Contract (ESPC). ESPC contract encumbrance continues until September 2030. Contract termination costs should be considered during project programming.

Table 7-2 **Summary of Proposed Demolition** (Facilities 2711–2745)

FACILITY NUMBER FACILITY USE AREAS (SF) FACILITY AGE YEAR BUILT 2711 Hana Like - Family Housing 9,230 24 1992 2712 Hana Like - Family Housing 9,230 24 1992 2713 Hana Like - Family Housing 9,230 24 1992 2714 Hana Like - Family Housing 5,840 24 1992 2715 Hana Like - Family Housing 5,840 24 1992 2716 Hana Like - Family Housing 9,230 24 1992 2717 Hana Like - Family Housing 5,840 24 1992 2718 Hana Like - Family Housing 5,840 24 1992 2719 Hana Like - Family Housing 5,840 24 1992 2720 Hana Like - Family Housing 5,840 24 1992 2721 Hana Like - Family Housing 9,230 24 1992 2722 Hana Like - Family Housing 9,230 24 1992 2723 Hana Like - Family Housing	lable 7-2 Summary of Proposed Demolition (Facilities 2/11–2/45)					
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2743 Hana Like - Family Housing 5,840 24 1992 2744 Hana Like - Family Housing 5,840 24 1992	2741	Hana Like - Family Housing	9,230	24	1992	
2744 Hana Like - Family Housing 5,840 24 1992	2742	Hana Like - Family Housing	5,840	24	1992	
	2743	Hana Like - Family Housing	5,840	24	1992	
2745 Hana Like - Family Housing 9,230 24 1992	2744	Hana Like - Family Housing	5,840	24	1992	
	2745	Hana Like - Family Housing	9,230	24	1992	

Table 7-2 **Summary of Proposed Demolition** (Facilities 2747–4050)

FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT	
2747	Hana Like - Family Housing	9,230	24	1992	
2747	Hana Like - Family Housing	9,230	24	1992	
2748	Hana Like - Family Housing	5,840	24	1992	
2749	Hana Like - Family Housing	9,230	24	1992	
2750	Hana Like - Family Housing	5,840	24	1992	
2751	Hana Like - Family Housing	5,840	24	1992	
2752	Hana Like - Family Housing	9,230	24	1992	
2753	Hana Like - Family Housing	5,840	24	1992	
4004	Golf Course Pesticide Storage*	1,220	29	1987	
4050	Golf Cart Shed*	6,720	31	1985	

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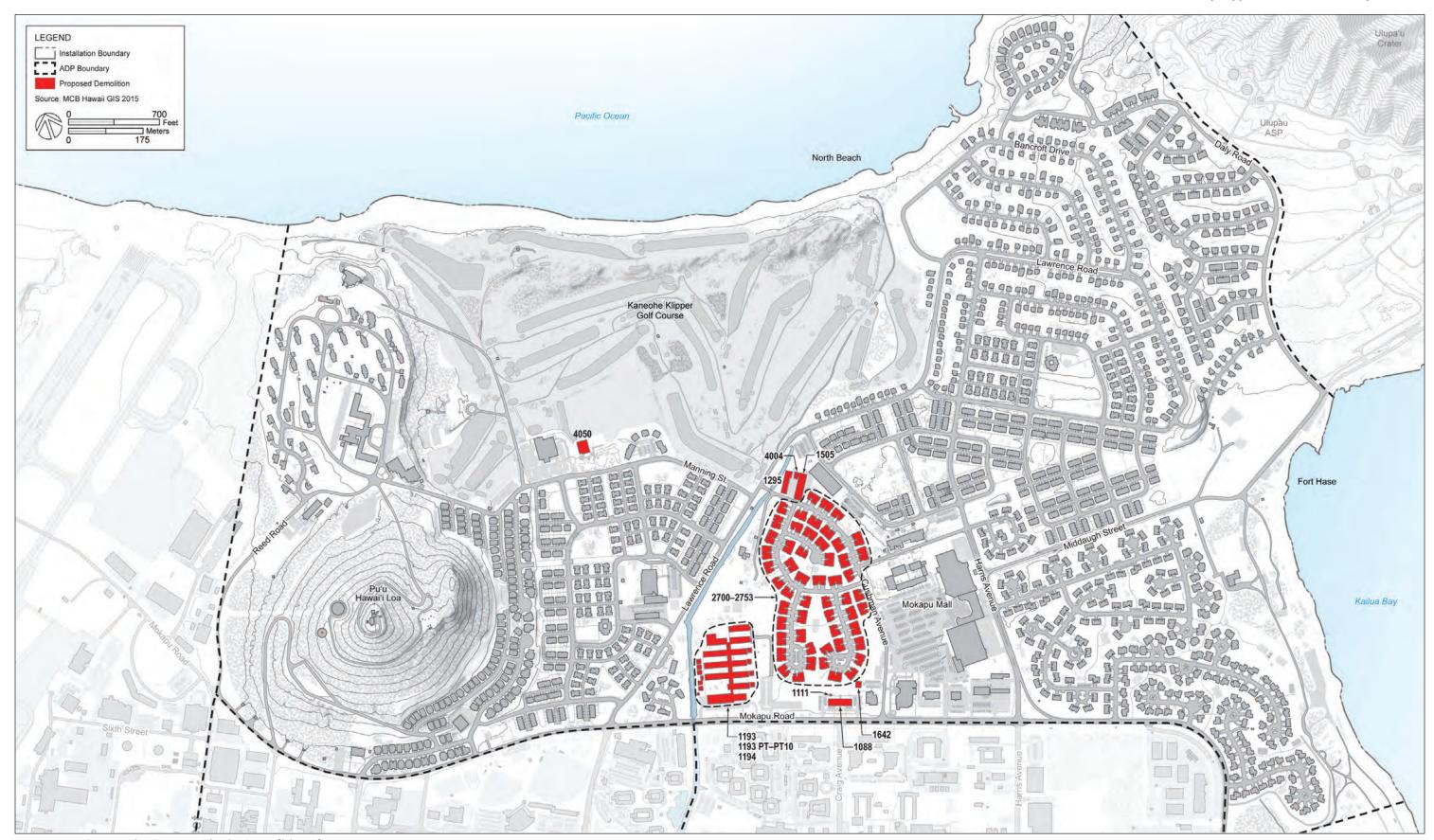


Figure 7-2 **Community Support District Demolition Plan**

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 $U.S.\ Marine\ Corps\ photo\ by\ Lance\ Cpl.\ Julian\ Temblador,\ MCBH\ Combat\ Camera/Released.\ www.mcbhawaii.marines.mil$

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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	IN	Inches
AC	Acre	IRP	Installation Restoration Program
ADP	Area Development Plan	KBRTF	Kaneohe Bay Range Training Facility
ASP	Ammunition Supply Point	KD	Known Distance
AT/FP	Antiterrorism/Force Protection	kV	Kilo Volt
BFR	Basic Facility Requirements	LOGCOM	Marine Corps Logistics Command
BN	Battalion	MAG	Marine Aircraft Group
BWS	Board of Water Supply	MAGTF	Marine Air Ground Task Force
CCN	Category Code Number	MARFORPAC	Marine Forces Pacific
CDET	College of Distance Education	MCAS	Marine Corps Air Station
	and Training	MCB Hawaii	Marine Corps Base Hawaii
CIP	Capital Improvement Plan	MCCS	Marine Corps Community Services
CISD	Communications Information Systems Directorate	MCO	Marine Corps Order
CLB	Combat Logistics Battalion	MCTAB	Marine Corps Training Area Bellows
CPRW	Commander, Patrol and Reconnaissance Wing	MIT	Moving Infantry Target
G		mm	Millimeter
DoD	Department of Defense	MSL	Mean Sea Level
EA	Each	MVA	Mega Volt Ampere(s)
EA	Environmental Assessment	NAVFAC PAC	Naval Facilities Engineering Command
ESQD	Explosive Safety Quantity Distance	NEDA	Pacific
FT	Feet	NEPA	National Environmental Policy Act
FP	Firing Point	PCA	Pearl City Annex
FY	Fiscal Year	PMO	Provost Marshal's Office
GIS	Geographic Information System	PN	Personnel
HECO	Hawaiian Electric Company	PSI	Pounds per Square Inch
HSM	Helicopter Maritime Strike Squadron	PV	Photovoltaic
ICRMP	Integrated Cultural Resources Management Plan	ROM	Rough Order of Magnitude
		RTF	Range Training Facility
IMP	Installation Master Plan	SAIA	Sikes Act Improvements Amendments
INRMP	Integrated Natural Resources Management Plan	SDZ	Surface Danger Zone
		SF	square foot/square feet

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SOCPAC Special Operations Command Pacific

SOI School of Infantry

SIT Stationary Infantry Target

TECOM Marine Corps Training and Education Command

TSF Training Support Facility
UDP Unit Deployed Program
UFC Unified Facilities Criteria
USPACOM U.S. Pacific Command

UM Unit of Measure

VR Navy Reserve Squadron

WMA Wildlife Management Area

WRF Water Reclamation Facility

WWBN Wounded Warrior Battalion

WWII World War II

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Ulupau District Area Development Plan



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The Area Development Plan (ADP) for the Marine Corps Base Hawaii (MCB Hawaii) Ulupau District was prepared as part of a larger master planning process for MCB Hawaii that encompasses all Marine Corps installations and landholdings in the State of Hawai'i. The MCB Hawaii master planning process included visioning, data collection, analysis, and development of plan alternatives for seven planning districts, including five at MCB Hawaii Kaneohe Bay and one each at Camp Smith and the Puuloa Range Training Facility. The ADPs inform a comprehensive plan presented in the MCB Hawaii Installation Master Plan (IMP).

The intent of this ADP is to articulate the vision and strategy for future land use and development within the Ulupau District over the next 20 years by following the master planning strategies, requirements, and report structure set forth in *Marine Corps Order (MCO) 11000.12* (September 2014) and *Unified Facilities Criteria (UFC) 2-100-01, Installation Master Planning* (May 2012) to the extend the guidance is applicable to the district. This ADP differs from the other districts at MCB Hawaii Kaneohe Bay in that its main goal is to limit future development to ensure that existing ordnance storage and live-fire training activities are not encroached by incompatible development. As such, the plan is limited in scope and only proposes projects that address the facility, training, and safety requirements of existing activities.

The *Ulupau District ADP* is organized into seven major sections that collectively represent each phase of planning analysis.

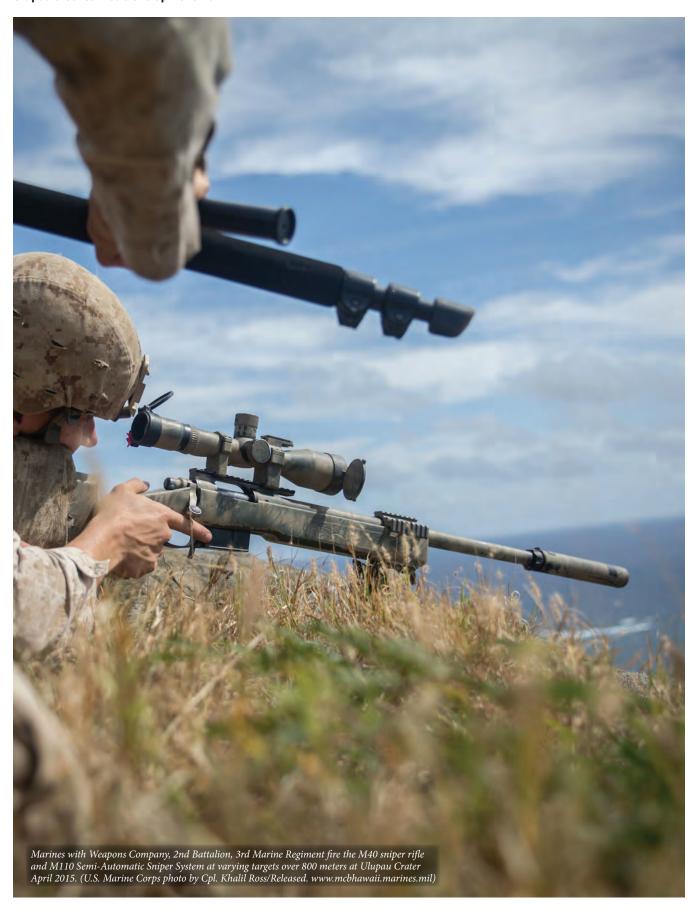
- Sections 1 through 5 presents the Ulupau District's vision, goals, and objectives, facility requirements, existing assets, functional relationships, base maps, and data sources used to develop the ADP.
- Section 6 analyzes the district in a regional and community context
 and describes on-site conditions and natural, cultural and manmade
 constraints. Plans for the Ulupau District were developed with a small
 group of stakeholders, and a recommended ADP is presented graphically
 on Illustrative, Circulation, and Regulating Plans.
- Section 7 presents an execution plan with rough order of magnitude (ROM) costs for the *Ulupau District ADP* in the context of the installation's existing Capital Improvement Program (CIP).

This ADP differs from the other districts at MCBH Kaneohe Bay in that its main goal is to limit future development to ensure that existing ordnance storage and live-fire training activities are not encroached by incompatible development. As such, the plan is limited in scope and only proposes projects that address the facility, training, and safety requirements of existing activities.



FOR OFFICIAL USE ONLY Introduction

Ulupau District Area Development Plan



1 Vision, Goals, and Objectives

1.1 Background

The Ulupau District is located on the northeastern portion of Mōkapu Peninsula at MCB Hawaii Kaneohe Bay as shown on Figure 1-1. Land in the district is largely used for the Kaneohe Bay Range Training Facility (KBRTF)—also referred to as the Ulupau Training Area—which is located inside the remnants of Ulupa'u Crater. (b) (7)(F)

(b) (7)(F)

a natural state. The base landfill is located in the southern portion of the district.

The Ulupau District shares the installation's overall vision as stated in the 2015 Vision Plan (MCB Hawaii 2015) as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.2 Ulupau District

The Ulupau District has its own vision, goals and objectives that take into consideration the District's unique mission, functions, location, and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved, and are specific and measurable. The planning goals and objectives were developed during the visioning workshop and subsequently refined at the planning charrette and concept workshop.

The planning goals of the Ulupau District include the following.

- **Ensure adequate infrastructure:** Maintain and improve existing facilities for the continuation of safe and secure operations.
- **Prevent encroachment:** Safeguard existing operational areas from activities that would impact mission training and readiness.

The specific planning objectives of the *Ulupau District ADP* are as follows.

- (b) (7)(F)
- Construct explosives training range

District Mission

The mission of the
Ulupau District is to provide
tenant units with live-fire

(b) (7)(F)

District Vision

In support of current and future missions, the planning vision for the Ulupau District is to provide remediated and sustainably

(b) (7)(F)

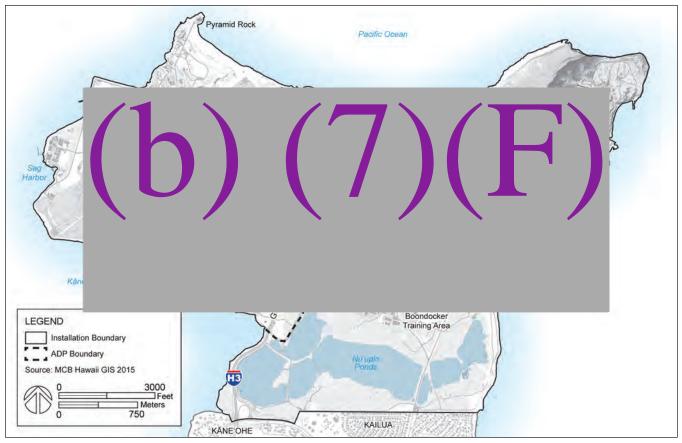


Figure 1-1 **District Location**

2 Facility Requirements and Land

This section of the plan establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Ulupau District ADP* is based.

2.1 Area Force Loading

2.1.1 MCB Hawaii Kaneohe Bay

Estimated personnel loading data for FY18 indicate MCB Hawaii Kaneohe Bay will have a total population just over 18,000, as shown in Table 2-1. This loading includes the arrival of two MV-22B squadrons, the departure of three Navy P-3 squadrons, and the arrival of a rotational Navy P-8 detachment. This population is spread throughout the base districts.

Table 2-1 **Projected FY18 Force Loading for MCB Hawaii Kaneohe Bay**

OFFICER ¹	ENLISTED ¹	CIVILIAN1	DEPENDENT ²	TOTAL
746	7,288	682	9,871	18,587

¹Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY12 Facilities Support Requirements document, FY12 Navy Manpower Report, and FY18 projected Tables of Organization. Unit Deployed Program (UDP) personnel have been subtracted from these numbers.

2.1.2 Ulupau District

This district contains (b) (7)(F) and the base landfill. Personnel loading is transient, and limited to those who come to the district to (b) (7)(F)

2.2 Area Equipment Loading

There is no major equipment (rolling stock) located within this district.

2.3 Facility Requirements

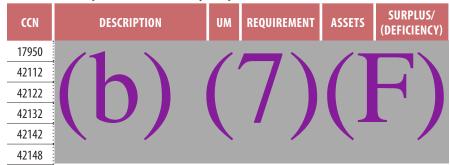
Basic Facility Requirements for the Ulupau District were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies in the Ulupau District are presented in Table 2-2.

² Dependent personnel numbers have been derived using December 2012 Defense Manpower Data Center reports. Includes UDP personnel and their dependents.

Table 2-2 **Ulupau District Facility Requirements** (CCN 14320–CCN 17945)

lable 2-2	2 Ulupau District Facility	кеqu	irements (CCN	14320-C	CN 17945)
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
14320	(b) $(7)(F)$				
17310	Range Operations Building	SF	7,283	5,892	(1,391)
17311	Range Support Building	SF	0	681	681
17330	Covered Training Area	SF	2,064	1,864	(200)
17410	Maneuver/Training Area, Light Forces	AC	0	525	525
17411	Maneuver/Training Area, Amphibious Forces	AC	0	66	66
17412	Land Navigation Course	AC	0	200	200
17413	Field Training Area	AC	0	160	160
17420	Maneuver/Training Area, Heavy Forces	AC	0	90	90
17430	Impact Area Dudded	AC	0	19	19
17431	Impact Area Non-Dudded	AC	0	10	10
17440	Personnel/Equipment Drop Zone	AC	0	11	11
17510	(1_)		7		
17550			_/ \		H
17560	101	\	///		
17570					
17670					
17730					
17830			: . :		: .
17906	Wheeled Vehicle Drivers Course	EA	0	1	1
17907	Tracked Vehicle Drivers Course	EA	0	2	2
17908	Amphibious Vehicle Training Area	EA	0	2	2
17916	Combat Trail	EA	0	2	2
17921	Armored Vehicle Launch Bridge, Raft, and Ford Area	EA	0	2	2
17930	(b) $(7)(F)$				_
17931	Medium Heavy Equipment Training Area	EA	0	2	2
17932	Decontamination Training Site	EA	0	2	2
17935	Weapons Range Operations Tower	EA	2	2	0
17940	(b) $(7)(F)$				
17945	Training Mock-ups	EA	2	7	5

Table 2-2 Ulupau District Facility Requirements (CCN 17950–CCN 42148)



2.4 Developable Real Estate

During the planning process, areas throughout the 370-ac Ulupau District were assessed with the MCB Hawaii Operations & Training Department for their ability to accommodate future development or redevelopment, and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- **Potentially Developable:** Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

The only Potentially Developable area is located on the southwestern flank of the Ulupau Crater and has been identified as a possible location for ground-mounted photovoltaic panels, as shown on Figure 2-1. All other lands are classified as Not Developable primarily due to restricted safety zones related to training and ammunition storage or environmental considerations.

2.5 District Assets

The three primary assets in the Ulupau District include the KBRTF, the Ulupau ASP, and the MCB Hawaii sanitary landfill. Ulupa'u Crater, part of an old crater rim, is a major geologic feature and landmark on the northeast end of the Mōkapu Peninsula. The crater, which rises to a height of 665-ft, is a distinguishing scenic landmark and an important open space asset for the base. Major facilities and other landmarks are illustrated on the Ulupau District Base Map (Figure 4-3) in Section 4.0, Base Maps. The (b) (7)(F) are described in Table 2-3.

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

Table 2-3 KBRTF Live Fire Range Descriptions

Table 2-3	KBRTF Live Fire Range Descriptions				
RANGE/ FACILITY	CCN	DESCRIPTION	KEY FEATURES		
R-1	17502	(b) ('	7)(F)		
R-2	17570				
R-3	17570, 17760	Shoot-house	360 degree live-fire, two story structure with nine rooms		
R-4	17502	Bivouac/Dry Training Area	Bleachers, outdoor classroom		
R-5	17530, 17581, 17610, 17630, 17710, 17730	(b) ('	7)(F)		
R-6	17570	(0) (<i>' </i>		
R-7	17581, 17610, 17630, 17710				
R-8	17830				
R-8A	17502, 17760, 17810				
R-9	17502				
R-9A	17670				
R-10	17560				
R-11	17610				

Source: MCB Hawaii Operations and Training Department, March 2016

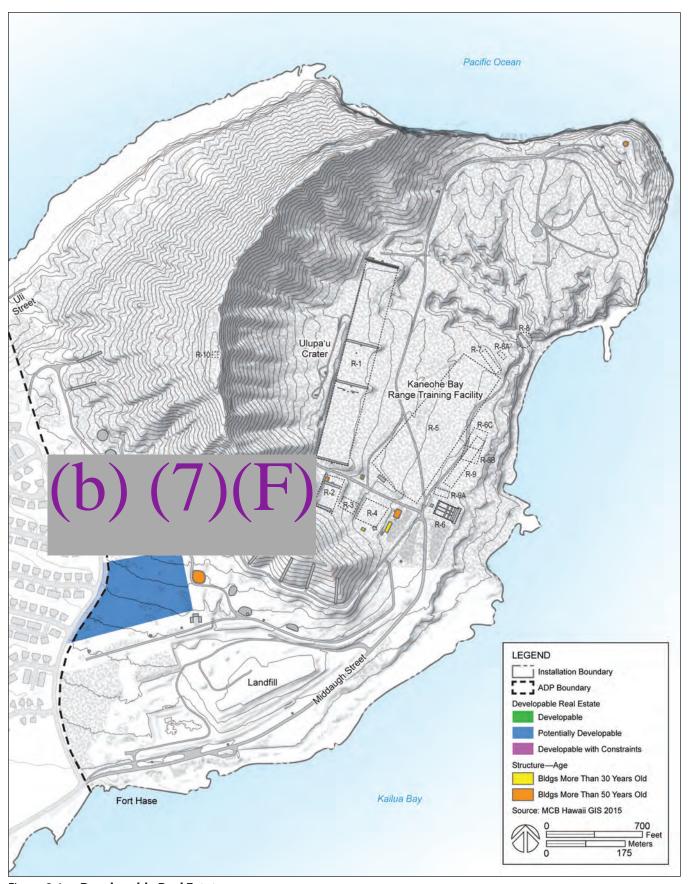


Figure 2-1 **Developable Real Estate**

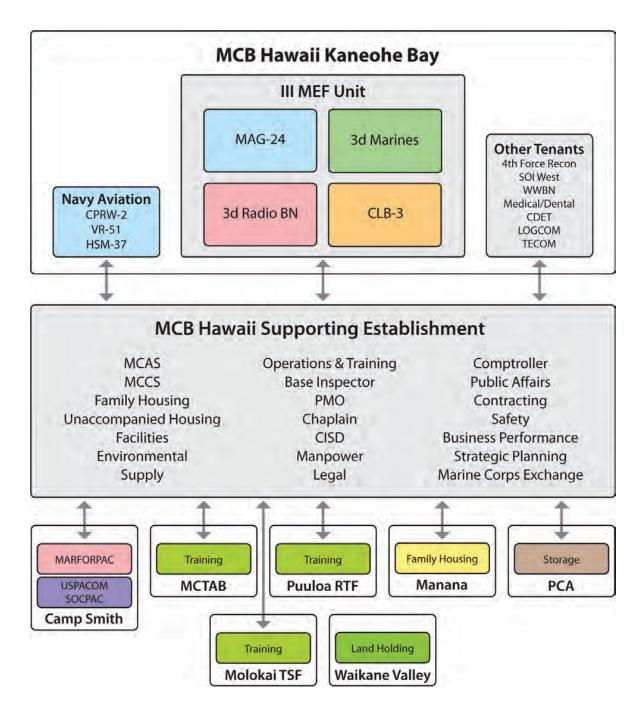


Figure 3-1 MCB Hawaii Functional Relationships

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii locations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawaii MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal Command Element functions/units do reside at various locations.

3.2 Ulupau District

Figure 3-2 illustrates the functional relationships between major land uses within the Ulupau District, which contains the live-fire training ranges and a light demolition range. Other district related uses and functions include munitions storage areas and a landfill.

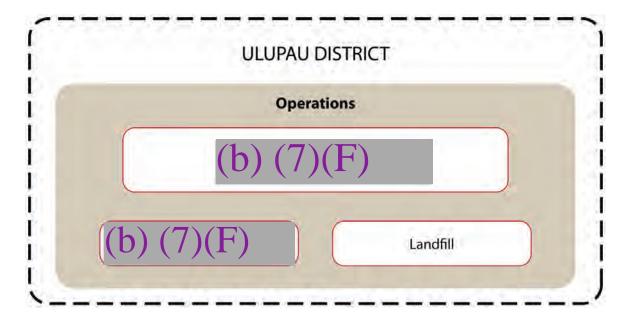


Figure 3-2 **Ulupau District Functional Relationships**

4 Base Maps

Section 4, Base Maps, shows the Ulupau District in the context of the neighboring windward O'ahu community (Figure 4-1) and in relation to the other areas of MCB Hawaii Kaneohe Bay installation (Figure 4-2). Figure 4-3 highlights the major facilities and the physical geography of the district.

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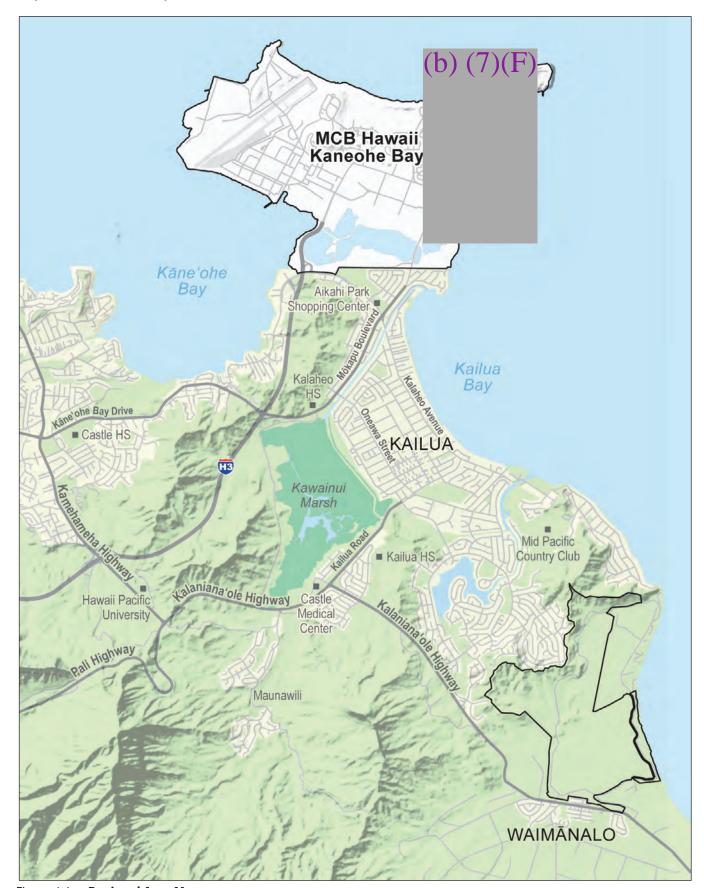


Figure 4-1 Regional Area Map

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Figure 4-2 **Installation Base Map**

15



Marine Corps Base Hawaii Installation Master Plan **Ulupau District Area Development Plan**

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6 Section 4 | Base Maps FOR OFFICIAL USE ONLY

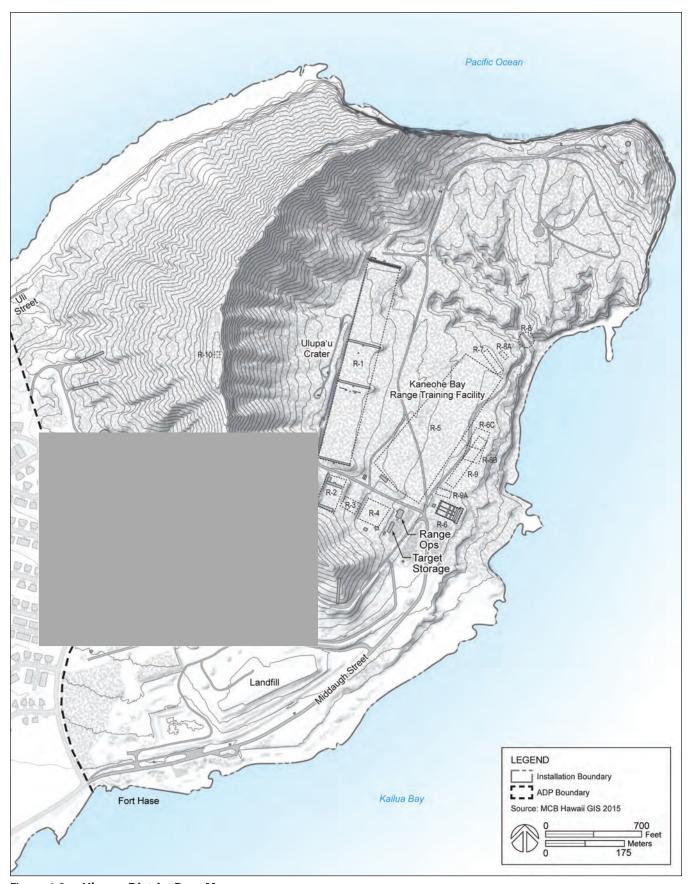


Figure 4-3 **Ulupau District Base Map**

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5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and Geographic Information System (GIS) and facility databases were all primary information sources contributing to the development of the *Ulupau District ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating in the district. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each event is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented below as follows.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities and other planning documents and metrics.

Commanding General, Marine Corps Forces Pacific, Commanding Officer, Marine Corps Base Hawaii and Naval Facilities Engineering Command. United States Marine Corps Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study. March 2014.

The study identifies Marine Corps training requirements, identifies gaps in capabilities, and develops recommendations for possible future training sites to sustain MAGTF training in the Hawaiian Islands.

Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. May 2013.

This environmental assessment (EA), prepared in accordance with the National Environmental Policy Act (NEPA), evaluates a proposal to provide suitable sites on Department of Defense (DoD) installations in Hawai'i to a private entity for the installation and operation of photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on Department of Defense installations on O'ahu and Kaua'i.

Ulupau District stakeholders included representatives from the following units and departments.

MCBH Leadership and Administration

Operations & Training Department

Explosive Safety Officer

Facilities Department

Public Works Department

Environmental Department

Energy Department

Naval Facilities Engineering
Command Pacific

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Section 5 | Data Collection

Naval Facilities Engineering Command Hawaii. Erosion Control Study for MCB Hawaii Ulupau Range Training Facility. Prepared by SEY Engineers. April 2013.

The Ulupau Range Training Facility has experienced severe erosion that requires mitigation for the range to remain operational. This erosion control study analyzes and documents the contributing cause of the erosion, and proposes three alternatives to minimize overland runoff flow and reduce soil erosion.

Headquarters, U.S. Marine Corps. Encroachment Control Plan, Marine Corps Base Hawaii. Prepared by Marstel-Day, LLC. June 2012.

This encroachment control plan is designed to assist Headquarters, U.S. Marine Corps in developing a comprehensive plan to mitigate encroachment issues and their impacts on the installation's operations. It identifies, assesses, and prioritizes current and potential encroachment impacts, including land space needs, natural resource management challenges, air space and frequency spectrum competition, cultural issues, potential urbanization, and other issues. Recommended management actions include active engagement with external stakeholders, government agencies and community leaders to prevent, minimize and/or mitigate impacts on mission capabilities.

U.S. Marine Corps Base Hawaii. Environmental Assessment for Construction of an Explosives Training Range at Ulupa'u Crater, Marine Corps Base Hawaii Kaneohe Bay. Prepared by Center for Environmental Management of Military Lands. January 2012.



Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

This plan provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (INRMP 2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

Naval Facilities Engineering Command (NAVFAC) Pacific. Electrical Utility System Assessment MCB Hawaii, Kaneohe, Hawaii. March 2011.

The purpose of this Electrical Utility System Assessment was to review the power requirements of future military construction projects and assess their impact on the MCB Hawaii Kaneohe Bay primary electrical distribution system. The entire system was surveyed, and existing capacity, condition, and reliability were assessed.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

This master plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

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Base ordnance Marines close the door of a subterranean tunnel magazine at the Ulupau Crater and reset the security system after collecting ammunition and ordnance for a training exercise on Marine Corps Base Hawaii, Jan. 23. The exact reason the magazines were built in the manner they were has been lost to history, but the magazines may have originated as fallout shelters during the post-World War II era of the late 1940s, said Chief Warrant Officer 4 Al Crespo, the base ordnance officer in charge and a native of New York City. At any time, base ordnance is required to maintain a prescribed stockpile to keep with the current and future demands of tenant units and training operations. (Photo by Cpl. James Sauter. www.dvidshub.net)

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6 ADP Area Analysis

Section 6, ADP Area Analysis, presents the regional, offsite, and onsite conditions related to the Ulupau District. Section 6.1 Regional Context, describes the neighboring civilian community. Section 6.2, Offsite Conditions, describes the general physical characteristics of MCB Hawaii Kaneohe Bay. Section 6.3, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resource constraints within the Ulupau District. A recommended Ulupau District Area Development Plan is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Ulupau District is located within the boundaries of MCB Hawaii Kaneohe Bay on Mōkapu Peninsula on the windward side of Oʻahu. Mōkapu Peninsula is bordered by Kāneʻohe Bay on the west, Kailua Bay to the east, and the Pacific Ocean to the north. On its south side, MCB Hawaii Kaneohe Bay abuts civilian lands, including a residential neighborhood of Kailua town, a City and County of Honolulu wastewater treatment plant, and portions of Kāneʻohe town. The combined population of the Kāneʻohe/Kailua region is approximately 82,750 residents, with approximately 44,100 residing Kāneʻohe and 38,650 residing in Kailua (U.S. Census 2010). Both Kailua and Kāneʻohe are primarily residential bedroom communities that include regional commercial, civil, and medical services.

Windward O'ahu is separated from the more densely populated and urbanized city of Honolulu by the Ko'olau mountain range. Access to MCB Hawaii Kaneohe Bay from Honolulu is available via three highways that tunnel through the Ko'olau mountain range—the Likelike Highway 63, Pali Highway 61, and the John A. Burns H-3 Freeway. Oahu Transit Services provides county bus service to MCB Hawaii Kaneohe Bay. Regular off-base service is provided by Route 56 with multiple stops located within walking distance of the main and Mokapu gates. On-base service is provided by Route 70 five times daily between 0750 and 1400.

See Section 4, Figure 4-1, Regional Area Map, for a map showing the Ulupau District in the context of windward O'ahu.

6.2 Offsite Conditions

This section describes the general physical characteristics of the entire MCB Hawaii Kaneohe Bay installation.

6.2.1 Geology

The Mōkapu Peninsula was formed by basaltic lava eruptions from four separate volcanic vents during the last period of volcanic activity on O'ahu. Major volcanic features of the peninsula include Kū'au or Pyramid Rock on the northwestern tip of the installation, Pu'u Hawai'i Loa in the central area, and Ulupa'u Crater on the northeastern tip.

Following this volcanic activity, the peninsula was inundated by a rise in sea level, during which time an extensive coral reef was formed. As sea level retreated to its present level, beaches and sand dunes were formed from the deposition of calcareous sand by the prevailing tradewinds. Approximately 280 ac of coral fill were added to the peninsula's marshy central drainage basin between 1939 and 1941 to both deepen the sea channel for marine vessels and create a runway (Department of the Navy 2006).

The Ulupa'u Crater is a predominant geologic feature and is characterized by steep slopes on the crater rim and a rocky ocean interface at its base. Following its formation approximately one million years ago, the crater was eroded over thousands of years by waves along the east and north sections of its outer circumference. At the same time, surface runoff flowing down the steep crater slopes created drainage channels that are relatively uniform in size and spacing along the outer slopes (Marine Corps Base Hawaii 2012).

6.2.2 Topography

Topography at MCB Hawaii Kaneohe Bay generally slopes towards the Nu'upia Ponds Wildlife Management Area (WMA), with coastal areas sloping toward the shores. The three volcanic highpoints, Pyramid Rock, Pu'u Hawai'i Loa, and Ulupa'u Crater, are at elevations of approximately 75 ft, 330 ft, and 665 ft above mean sea level (msl), respectively.

6.2.3 Hydrology

The Mokapu Central Drainage Channel is a lined stream channel that runs through much of the base and empties into the Nu'upia Ponds WMA and ultimately into Kāne'ohe Bay. Several watershed improvement projects have been conducted over the years in the vicinity of the drainage channel to remove invasive weeds and replace them with native plants. These wetland and watershed projects have increased stormwater retention capacity, reduced sedimentation into the Nu'upia Ponds and Kāne'ohe Bay, and improved water quality. The projects have also created a more aesthetically pleasing environment and improved habitat for native waterbirds.

There are approximately 131 ac of U.S. Army Corps of Engineers jurisdictional wetlands at MCB Hawaii Kaneohe Bay, covering five sites. The largest concentration of wetlands are in and around the Nu'upia Ponds WMA. Pockets of wetland are located within the Kaneohe Klipper Golf Course, next to the salvage yard, and at West Field.

6.2.4 Soils

Soil types identified at MCB Hawaii Kaneohe Bay range from clay to fine beach sand and are shown on Figure 6-1. The majority of soils on the installation consist of well-drained soils developed from coral, lava and/or alluvium, which provide a solid foundation for construction. Makalapa Clay (MdB, MdC), a prominent soil type around the slopes of Ulupa'u Crater, has high expansion and contraction

potential that makes it poor for construction purposes. Soils associated with Rock Land (rRK) have similar expansion and contraction characteristics. (Department of the Navy 2006).

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild trade winds, while winter has higher rainfall, cooler temperatures, and stronger trade winds. The predominant wind direction in the Hawaiian Island is from the east–northeast at 10 knots.

In the vicinity of MCB Hawaii Kaneohe Bay, the median annual rainfall is approximately 40 in. Monthly average low and high temperatures at MCB Hawaii Kaneohe Bay range from 76 to 85 degrees Fahrenheit in the warmest month (September) and from 69 to 79 degrees Fahrenheit during the coolest month (January).

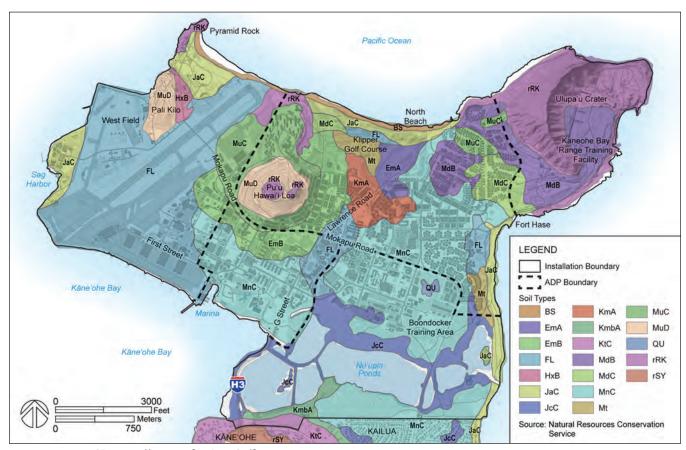


Figure 6-1 MCB Hawaii Kaneohe Bay Soils Map

6.2.6 Vegetation

Most of the developed land and open space MCB Hawaii Kaneohe Bay contains planted landscape material, typically Bermuda grass and a variety of native and non-native planted trees and shrubs. The non-managed dry land vegetated areas, including around Pu'u Hawai'i Loa and Ulupa'u Crater, are dominated by non-native *koa haole* (*Leucanena leucocephala*) shrubland. Undeveloped shoreline areas include native sea strand vegetation.

According to the INRMP (2011), since 2008, natural resources staff have discovered several 'ōhai (Sesbania tomentosa) plants in the dune vegetation next to the shearwater colony on the Kailua Bay side of the installation. 'Ōhai is listed as a federal endangered species. The plants have been placed in custom built cages to protect them from rodents, and the area is monitored regularly by MCB Hawaii environmental staff. There are no other natural occurrences of plants currently listed or pending listing as endangered under the Federal Endangered Species Act (Marine Corps Base Hawaii 2011 and Department of the Navy 2006).

6.2.7 Wildlife Habitat

There are two designated WMAs at MCB Hawaii Kaneohe Bay: the 482-ac Nu'upia Ponds WMA and the 23-ac Ulupa'u Head WMA. The Nu'upia Ponds WMA provides habitat for endemic, endangered waterbirds, shorebirds, and seabirds, and provides refuge to 16 native fish species. The Ulupa'u Head WMA is one of two red-footed booby or 'Ā (Sula sula rubripes) colonies in the main Hawaiian Islands. Although not a designated wildlife management area, the wetland areas at the Kaneohe Klipper Golf Course provide habitat for many of the same waterbirds, shorebirds, and seabirds.

Endangered Hawaiian water bird species that feed and breed at MCB Hawaii Kaneohe Bay include the endemic Hawaiian duck or *koloa maoli (Anas wyvilliana)*, the endemic Hawaiian coot or *'alae ke'oke'o (Fulica americana alai)*, the endemic Hawaiian moorhen or *'alae 'ula (Gallinula chloropus sandvicensis)*, and the endemic Hawaiian stilt or *ae'o (Himantopus mexicanus knudseni)*. The Newell's shearwater or *'a'o (Puffinus auricularis)* is a federal-listed threatened species that has been observed in the area. The endemic short-eared owl or *pueo (Asio flammeus sandwichensis)* is included on the state list of endangered species and has also been observed in the area.

The waters off MCB Hawaii Kaneohe Bay are home to four federal-listed endangered species of animals, including the endemic Hawaiian monk seal or *'ilio holo i ka uaua (Monachus schauinslandi)*, the sperm whale (*Physeter catodon*), the migratory humpback whale or *koholā (Megaptera novaeangliae)*, and the migratory hawksbill sea turtle or *'ea (Eretmochelys imbricata)*. The green sea turtle or *honu (Chelonia mydas)* is a federal-listed threatened species that has been observed in the area (Marine Corps Base Hawaii 2011).

6.3 Onsite Conditions

The Ulupau District is located on the far northeastern corner of the Mōkapu Peninsula. This remote district is mostly undeveloped, is characterized by the visually prominent Ulupa'u Crater, and includes the installation's live-fire training area. It abuts the Community Support District on its western side and is surrounded on its other sides by the Pacific Ocean and Kailua Bay.

6.3.1 Land Use

Figure 6-2 illustrates land use within the Ulupau District, which is a mix of operations, training, and base support. Lands within the district and surrounding waters are under the control of the federal government and are not subject to any state or county land use controls or public access entitlements.

6.3.2 Transportation Network

Figure 6-3 shows the roadway network within the Ulupau District. Access to the district is via Middaugh Street, which originates east of the Mokapu Mall and continues into the KBRTF.

6.3.3 Utilities

This section provides an overview of the water, electrical, wastewater, storm drainage and communication systems at MCB Hawaii Kaneohe Bay and highlights utility issues specific to the Ulupau District.

Water System

Figure 6-4 illustrates the water distribution system in the Ulupau District. In general, the water supply, distribution, and storage capacity at MCB Hawaii Kaneohe Bay is adequate for existing and future needs in the Ulupau District.

The Ulupau District is served by the MCB Hawaii Kaneohe Bay water system, which is operated and maintained by the MCB Hawaii Facilities Department Maintenance Division. The potable water distribution system includes approximately 240,000 feet of water lines, two pump stations, five reservoirs, altitude valves, sectional valves, service valves, pressure regulating valves, fire hydrants, water meters, and a chlorination and fluoridation facility. Water comes

(b)
$$(7)(F)$$

BWS is under contract to provide 5,200 gallons per minute at 60 pounds per square inch (psi); however, actual service since 1999 has ranged from 100 to 110 psi. Daily water use measures approximately two million gallons per day with adequate pressure for all existing general uses. (b) (7)(F)

transformer supporting this facility limits the number of pumps that can operate at the same time, thereby limiting the amount of water pressure the installation can organically generate. There are no potable water wells on MCB Hawaii Kaneohe Bay.

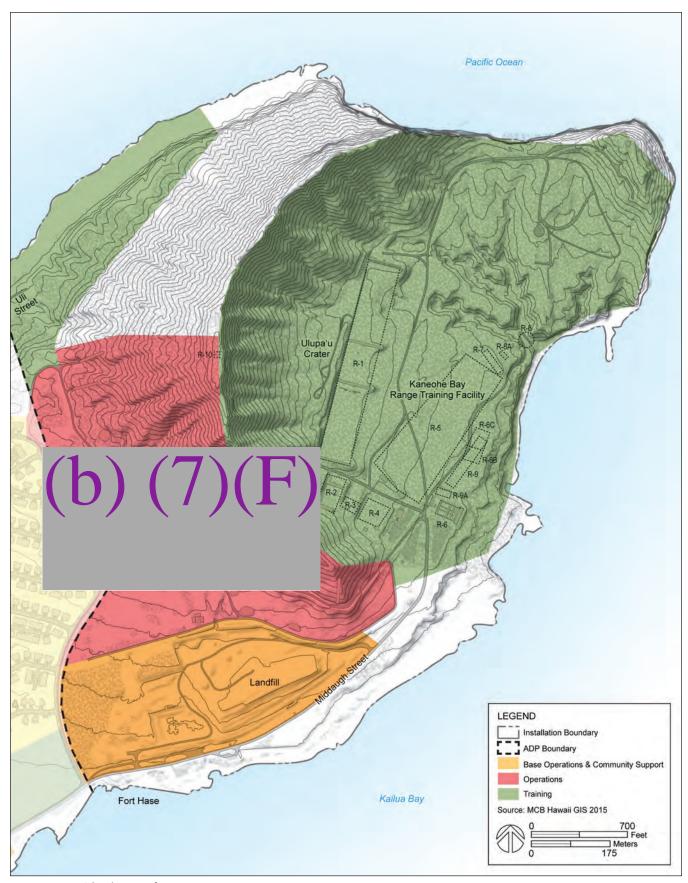


Figure 6-2 **District Land Use Map**

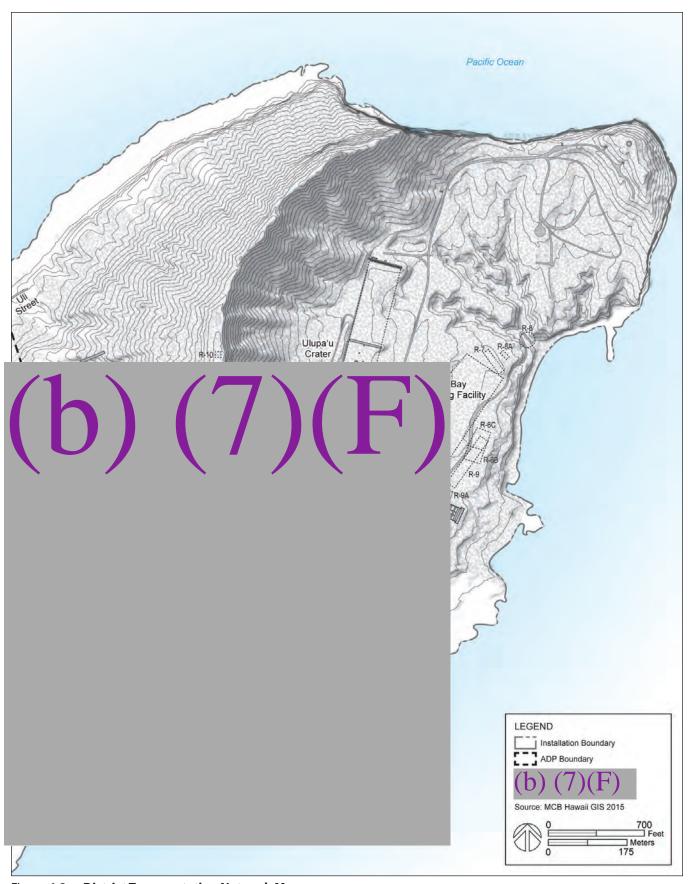


Figure 6-3 **District Transportation Network Map**

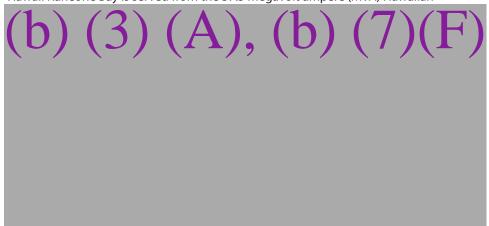
Wastewater System

Figure 6-5 illustrates the wastewater collection system in the Ulupau District. The KBRTF is not connected to the MCB Hawaii wastewater collection system and requires the use of three septic tanks for sewer collection and storage.

The MCB Hawaii wastewater collection system is operated by the MCB Hawaii Facilities Department. The wastewater collection system is comprised of approximately 920 manholes, 171,800 ft of gravity sewers and force mains, and 20 pump stations. Wastewater is collected and conveyed to the Water Reclamation Facility (WRF) located west of the main gate in the Base Support District. The WRF is a secondary biological treatment plant. MCB Hawaii seeks to upgrade the treatment and electrical systems of the plant in the near-term to provide redundant critical systems. Some treated R2-quality effluent is typically pumped to the Kaneohe Klipper Golf Course for irrigation while the rest is routed to the City and County of Honolulu Kailua Wastewater Treatment Plant for discharge through the Mōkapu deep ocean outfall under a National Pollutant Discharge Elimination System permit from the State of Hawai'i Department of Health (HHF Planners 2013).

Electrical System

Figure 6-6 illustrates the electrical distribution system in the Ulupau District. MCB Hawaii Kaneohe Bay is served from the 37.5 megavolt ampere (MVA) Hawaiian



In 2013, a final EA and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV panels in non-family housing areas in partnership with NAVFAC Hawaii. A 5.5-ac site in the Ulupau District is approved for ground-mounted PV installation, as shown on Figure 6-6.

Stormwater Management System

There are no reports of significant flooding issues during storm events in the Ulupau District.

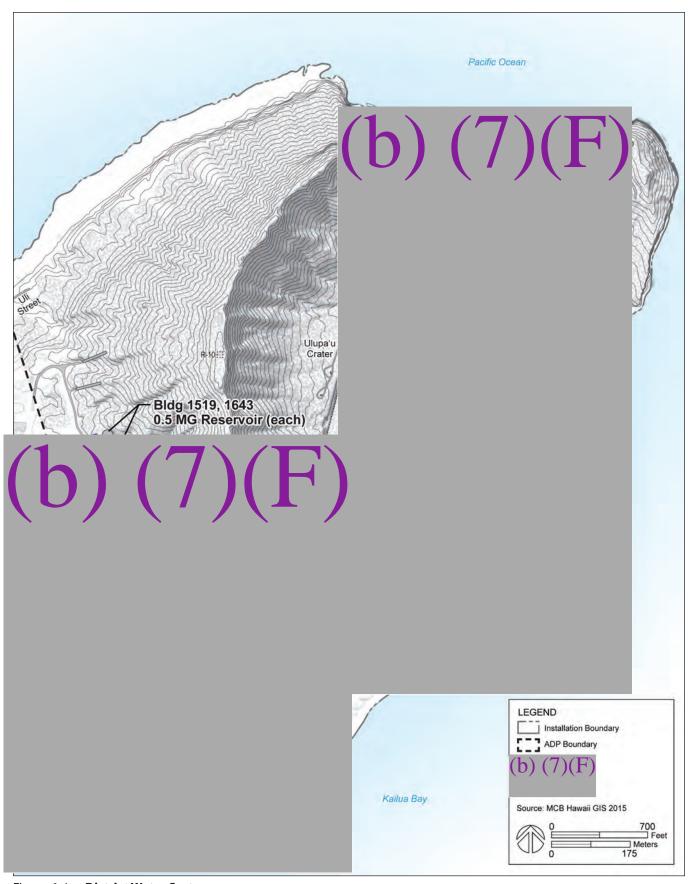


Figure 6-4 **District Water System**



Figure 6-5 **District Wastewater System**

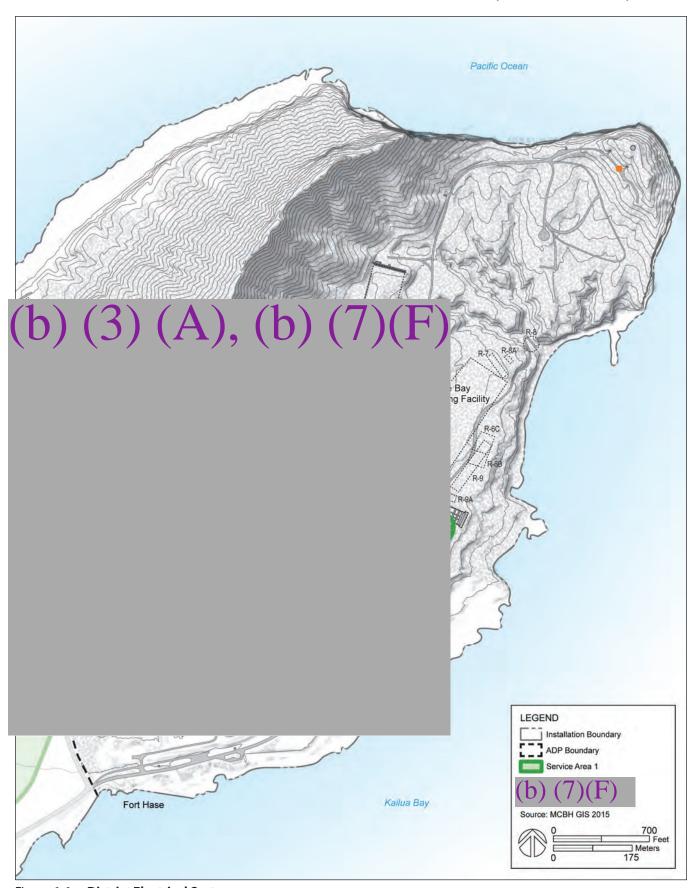


Figure 6-6 **District Electrical System**

Solid Waste Disposal

Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupa'u Crater, as shown on Figure 4-3 in Section 4, Base Maps. MCB Hawaii provides solid waste collection and disposal for administrative, industrial, military, commercial and bachelor quarters areas of MCB Hawaii Kaneohe Bay. Waste amounting to approximately 5,000 tons per year is placed in the landfill. At the present rate of waste generation, the landfill site should accommodate MCB Hawaii Kaneohe Bay's requirements for another 10–20 years, provided there are no changes in current regulations and cover material is readily available. However, the Environmental Department is currently conducting a study to evaluate permanently closing the landfill prior to it reaching capacity. A commercial contract service collects solid waste from public-private venture family housing areas for disposal at off-base facilities.

The MCB Hawaii Environmental Department operates a recycling center in Building 132 next to the marina. Traditional recyclables, wood pallets, and reusables from operational, maintenance, administrative, bachelor quarters, and community support areas are accumulated and processed for sale or for on-base reuse.

6.3.4 Environmental Conditions and Hazards

Figure 6-7 highlights specific environmental resources and hazards found in the Ulupau District.

Flood Plain

According to the Federal Emergency Management Agency, the majority of the district is designated Flood Zone D—an area where flooding is possible but risk in undetermined. A portion of the Kailua Bay shoreline on the southern edge of the district is susceptible to flooding from storm surf (flood zone VE) although it is not considered developable.

Wildlife Habitat

The 23-ac Ulupa'u Head WMA is one of two red-footed booby or ' \bar{A} (Sula sula rubripes) colonies in the main Hawaiian Islands.

Installation Restoration Program Sites

Installation Restoration Program (IRP) sites are locations where releases of hazardous materials or petroleum products require remediation or other follow up efforts. There are three remediation sites in the districts. The Old 3.5" Rocket Range and Ordnance Demolition Range are considered closed and require no further action. The Range Disposal Area is considered active and requires further remediation.

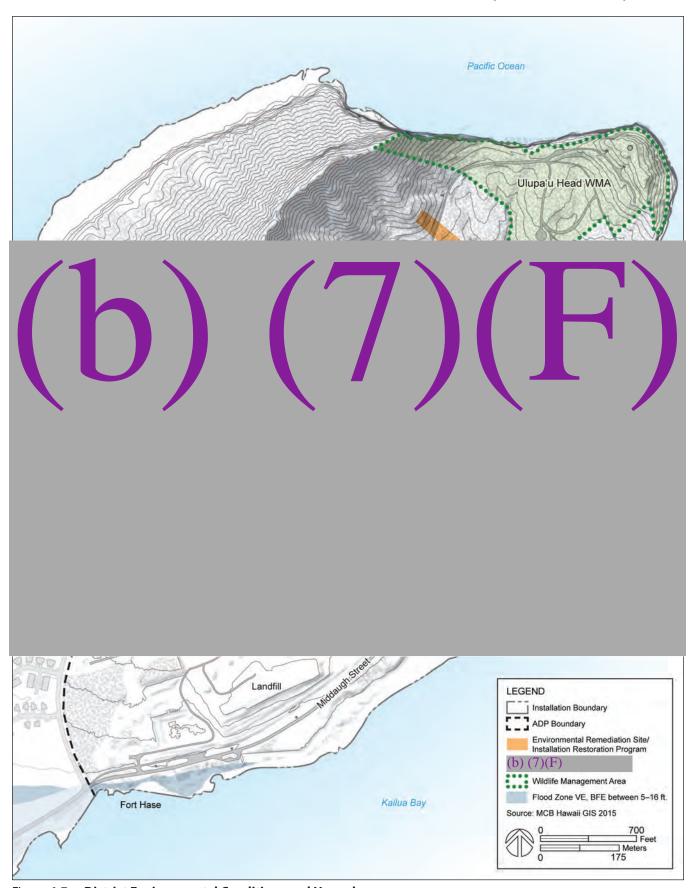


Figure 6-7 **District Environmental Conditions and Hazards**

6.3.5 Archaeological and Historic Architectural Resources

Figure 6-8 shows the archaeological and historic architectural resources in the Ulupau District.

Archaeological Resources

The MCB Hawaii ICRMP (2011) identifies the entire district as having low archaeological sensitivity. Three sites have been identified on the northwestern slope of Ulupa'u Crater. Should archaeological deposits or human remains be discovered during any construction or other ground-disturbing activity, Standard Operating Procedures for inadvertent discoveries will be followed (Department of the Navy 2014).

Historic Architectural Resources

There are 20 historic buildings and structures in the district that have been determined eligible for listing on the National Register of Historic Places. These include World War II (WWII) era magazines, ordnance storehouses, a storage shed, and Battery Pennsylvania. Battery Pennsylvania (Facility 1571; Site 50-80-11-1431), located on the north rim of Ulupa'u Crater, is a WWII battery that is cross-listed as both an architectural and archaeological site. Construction of Battery Pennsylvania began in the early years of WWII but was not completed until near the end of the war. One of the turrets with three 14-in guns was salvaged from the sunken USS Arizona and set up at this battery; some of the doors in the battery are also said to be from the destroyed battleship.

6.3.6 Safety Hazards

Safety hazards related to military operations in the Ulupau District are shown on Figure 6-9.

Explosive Safety Quantity Distance Arcs

Explosive safety quantity distance (ESQD) arcs are cast from the ordnance storage magazines and modular armories located (b) (7)(F)

(b) (7)(F)

Surface Danger Zone

Each live-fire range has a SDZ that defines a mathematically predicted area where a projectile will impact upon returning to earth, either by direct fire or ricochet. Areas inside these zones need to be clear of personnel, including the surrounding public waters, during range operations. A boat guard is posted to watch for boats which might enter the danger zone during training exercises with machine guns or larger weapons. Firing is ceased until transiting boats have safely cleared the area.

6.3.7 AT/FP Physical Security

Antiterrorism/force protection (AT/FP) measures are intended to protect personnel, infrastructure and critical resources from outside attack. The AT/FP criteria mandate measures be taken in both site and building design, which can have an appreciable impact on site and building planning, as well as on construction cost.

The Ulupau District is surrounded by water on three sides, and access to all waters surrounding the Mōkapu Peninsula is subject to a 500-yard security buffer due to its designation as a Naval Defensive Sea Area. Within the boundary of the installation, additional AT/FP guidelines dictate separation distances between roadways and buildings, which can affect building orientation, setbacks from roadways and parking areas, adjacencies between buildings, and construction types. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-1*, *Installation Master Planning* (May 2012). Figure 6-10 shows lands in the Ulupau District encumbered by the standoff distances for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries.

6.3.8 Sources of Air, Noise, and Light Pollution

Live-fire training activities within the Ulupau District can generate high levels of noise, with the potential to impact noise sensitive land uses. The nearest neighborhoods include the Kaluapuni Housing area, Nani Ulupau Housing Area, and Ulupau Housing area. Because the range is located inside the remains of Ulupa'u Crater, much of the noise is buffered by the crater walls.

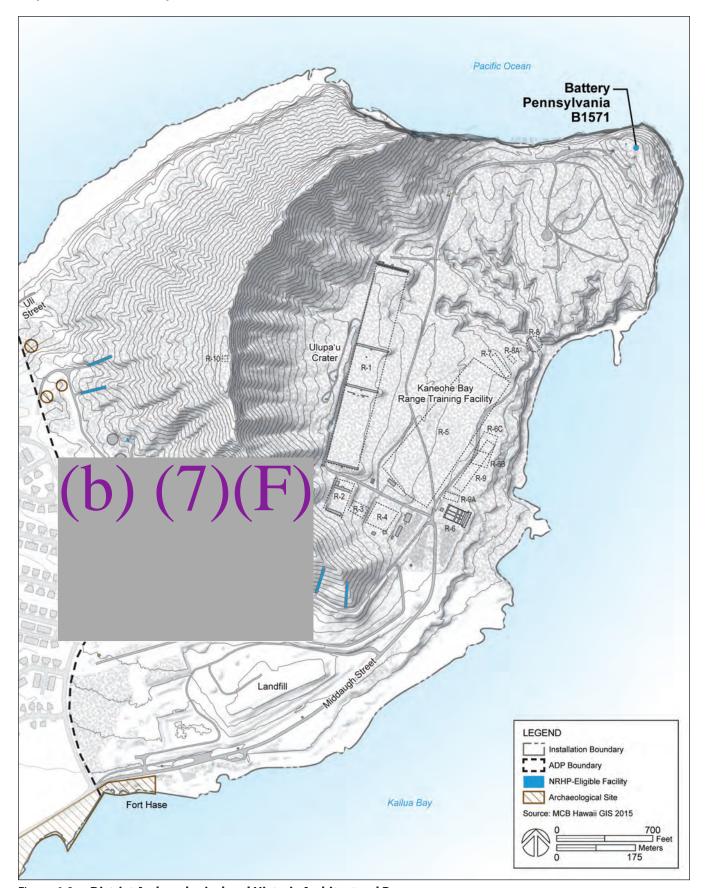


Figure 6-8 **District Archaeological and Historic Architectural Resources**

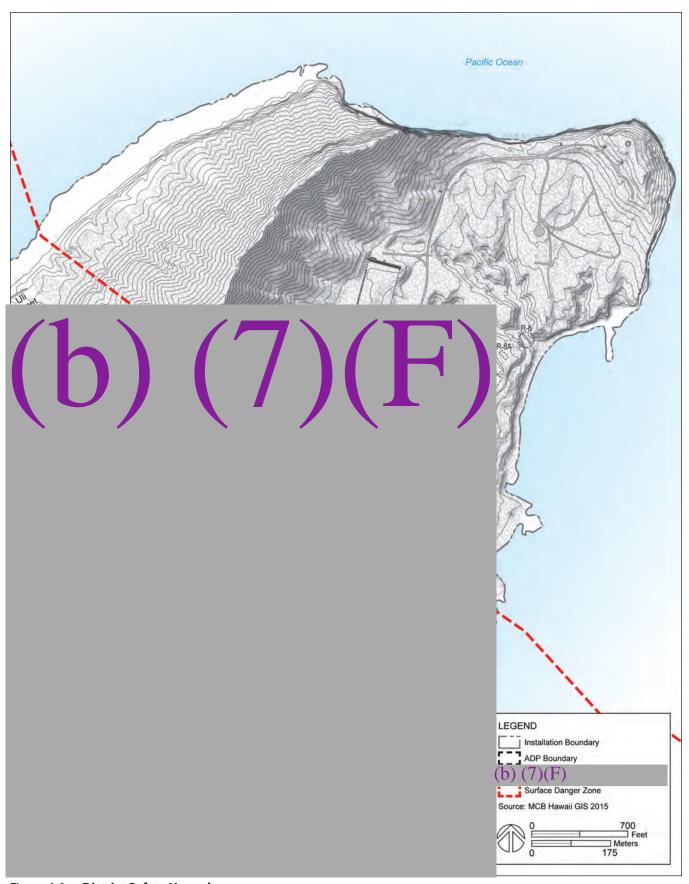


Figure 6-9 **District Safety Hazards**

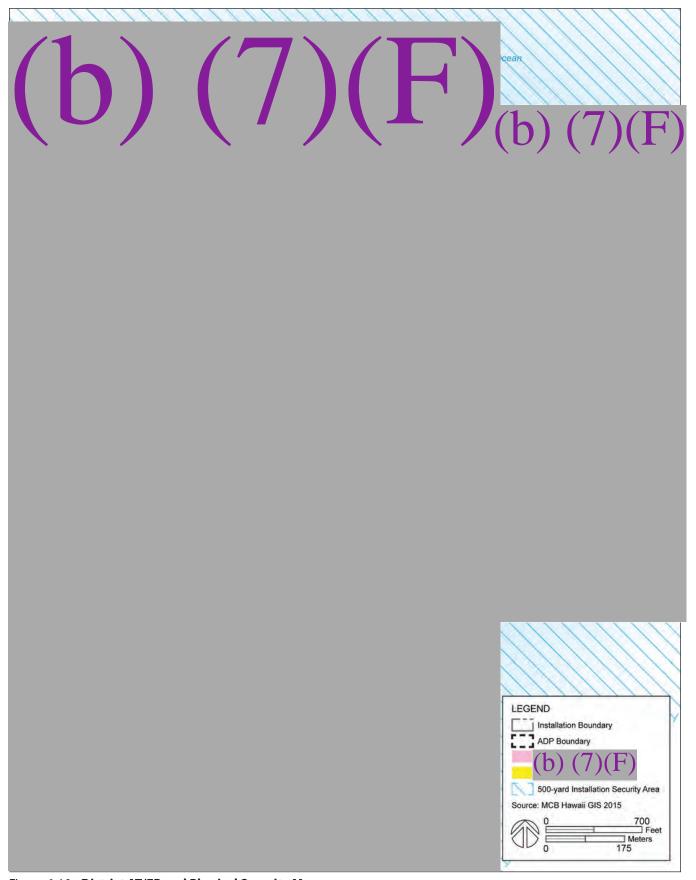


Figure 6-10 District AT/FP and Physical Security Map

6.4 Alternative Site Development and Evaluation

The primary goal of the Ulupau District is to limit future development to projects that address the facility, training, and safety requirements of existing ordnance storage and live-fire training activities. As such, future development is limited in scope and did not require the development of alternative planning actions for evaluation, as only three projects are proposed for the district.

6.5 Area Development Plan

This section presents the ADP for the Ulupau District at MCB Hawaii Kaneohe Bay. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific district-level goals and objectives. Future development envisioned for the Ulupau District is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.5.1 Illustrative Plan

The Illustrative Plan graphically portrays planned, programmed, and recommended future development that supports the overarching planning goals for MCB Hawaii Kaneohe Bay. The Ulupau District Illustrative Plan (Figure 6-11) reflects MCB Hawaii's desire to strictly limit development in the district. The three projects proposed in this ADP are described as follows.



Soil Stabilization

Construct catchments, drainages, and basins as detailed in the *Ulupau Range Training Facility Erosion Control Study* (April 2013) to ensure continued range operations through the implementation of best management practices to minimize overland runoff flow and reduce soil erosion.



6.5.2 Regulating Plan

The Regulating Plan provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum

and maximum building heights (floors) to appropriately increase development density at MCB Hawaii Kaneohe Bay. The building height guidelines intend to maximize the development potential of the Installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for the Ulupau District continues the existing operational and training uses. Building types prescribed by the Regulating Plan are defined in *UFC* 2-100-01, Installation Master Planning (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)
- Medical Building Types (medical centers and clinics)
- Commercial Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, bowling alley and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.5.3 Circulation and Parking Plan

No major circulation or parking issues have been identified in the district. The Circulation and Parking Plan reflects existing conditions and the new access roads and parking areas to support the projects shown on the Illustrative Plan.

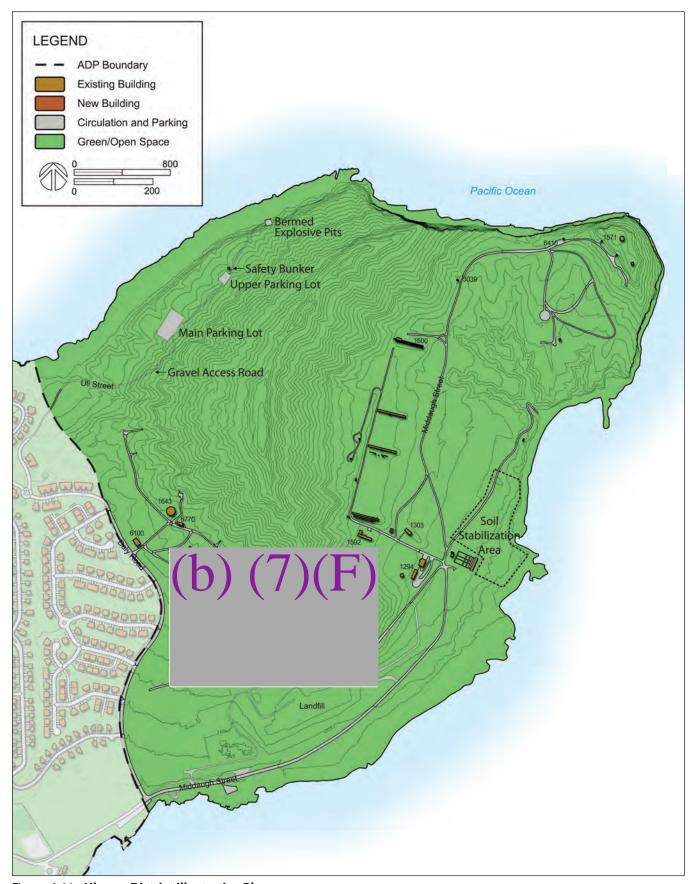


Figure 6-11 Ulupau District Illustrative Plan

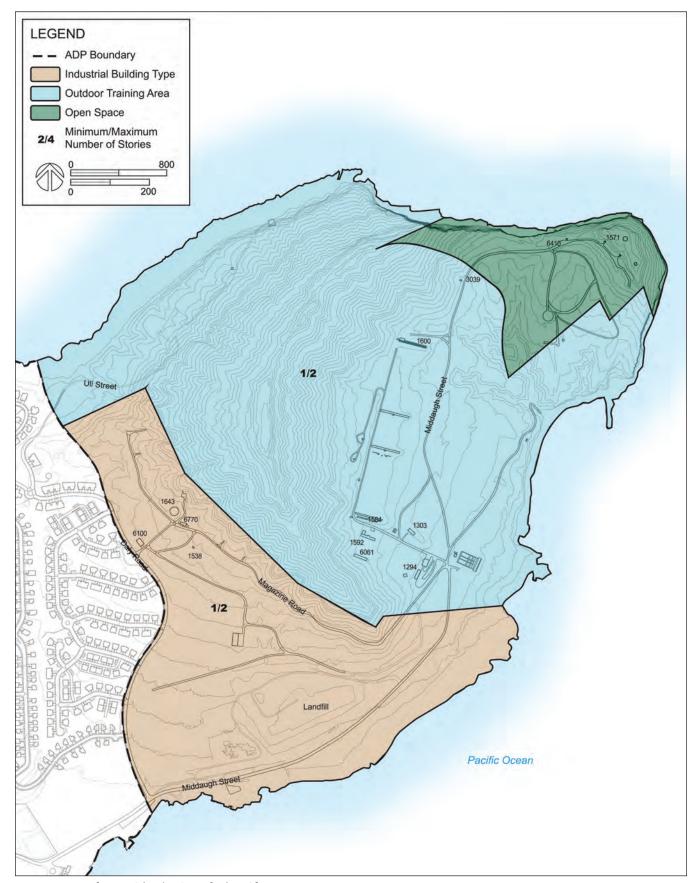


Figure 6-12 **Ulupau District Regulating Plan**

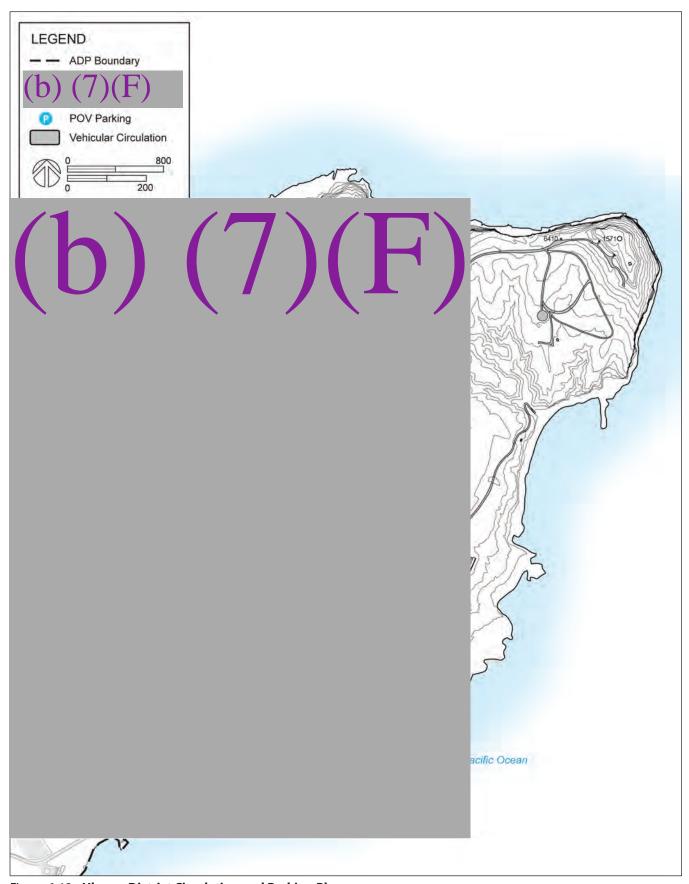


Figure 6-13 Ulupau District Circulation and Parking Plan



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7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Ulupau District ADP*. No dependent actions and project phasing is required for implementation of the proposed actions. The plan is presented graphically on Figure 7-1 and detailed in Table 7-1, which describes the planning actions, including any required demolition.

The timeframe of planning actions are classified as short-term, mid-term, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions, as proposed in this ADP, consist of existing projects developed as part of the Installation's current five-year Program Objective Memorandum program. Mid-term projects are intended to be executed between five and ten years.

Table 7-1 **Summary of Proposed Development Actions**

Map ID	Time Frame	MCB Hawaii Project #	Project Title and Description	ROM Cost (\$K)
1	Short-term	P-879	(b) (7)(F)	(b) (5)
2	Short-term	Proposed	Ulupau Range Training Facility Soil Stabilization Plan and program preferred mitigation alternative	
3	Mid-term	Proposed	(b) (7)(F)	

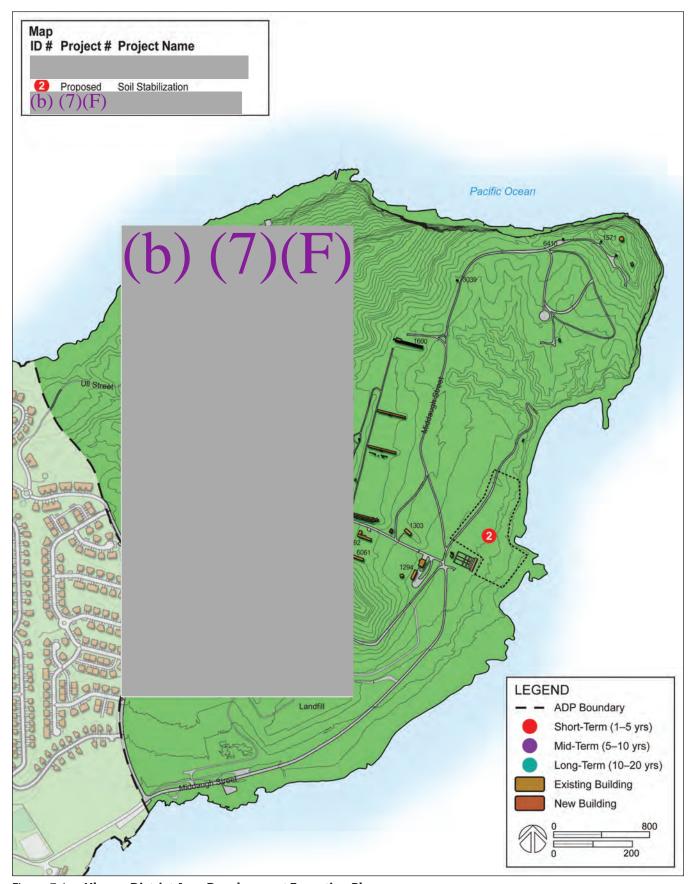


Figure 7-1 **Ulupau District Area Development Execution Plan**

7.2 Demolition Plan

Figure 7-2 highlights facilities proposed for demolition in the Ulupau District. These three facilities will no longer be need to meet facility requirements after the construction of an earth-covered magazine. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition**



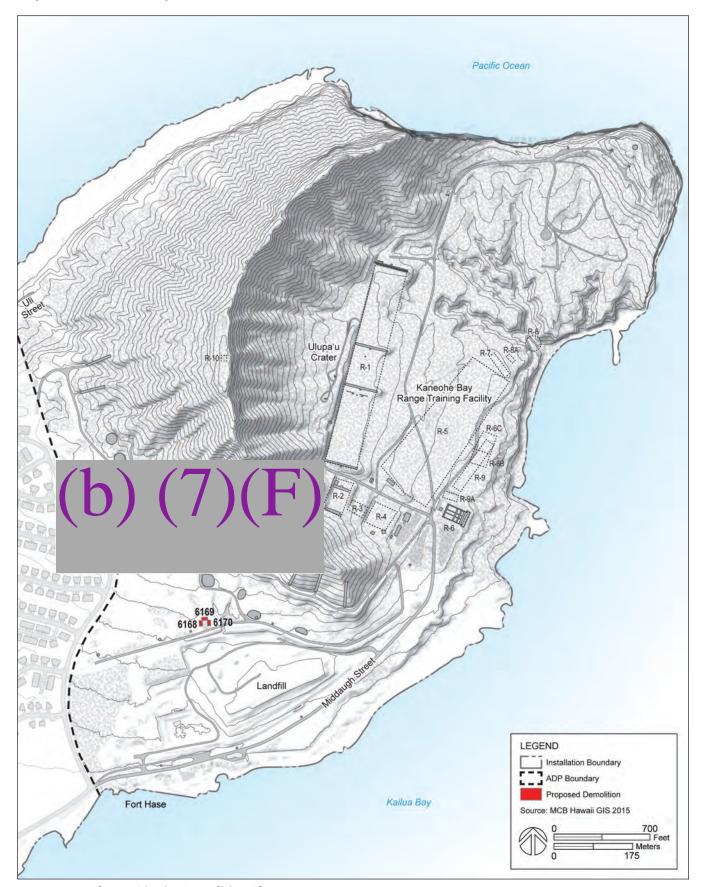


Figure 7-2 **Ulupau District Demolition Plan**



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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	IRP	Installation Restoration Program
AC	acre/acres	JIATF-W	Joint Interagency Task Force-West
ADP	Area Development Plan	kV	Kilovolt
AT/FP	Antiterrorism/Force Protection	kVA	Kilovolt Ampere
BEQ	Bachelor Enlisted Quarters	LOGCOM	Marine Corps Logistics Command
BFR	Basic Facility Requirements	MAG	Marine Aircraft Group
BWS	Board of Water Supply	MAGTF	Marine Air Ground Task Force
CCN	Category Code Number	MARFORPAC	Marine Corps Forces Pacific
CDET	College of Distance Education and Training	MCAS	Marine Corps Air Station
CIP	Capital Improvement Plan	MCB Hawaii	Marine Corps Base Hawaii
CISD	Communications Information Systems	MCCS	Marine Corps Community Services
CISD	Directorate	MCO	Marine Corps Order
CLB	Combat Logistics Battalion	MCTAB	Marine Corps Training Area Bellows
CMSA	Cruise Missile Support Activity	MILCON	Military Construction
COA	Course of Action	MWR	Morale, Welfare and Recreation
CPRW	Commander, Patrol and Reconnaissance Wing DoD	NAVFAC	Naval Facilities Engineering Command Pacific
	Department of Defense	NCPAC	Central Security Service Pacific
EA	Each	NRHP	National Register of Historic Places
EA	Environmental Assessment	PAC	Pacific
ECP	Entry Control Point	PCA	Pearl City Annex
EMR	Electromagnetic Radiation	PMO	Provost Marshal's Office
FT	Feet	PN	Personnel
FY	Fiscal Year	PV	Photovoltaic
GIS	Geographic Information System	ROM	Rough Order of Magnitude
HECO	Hawaiian Electric Company	RTF	Range Training Facility
HI	Hawaii	SAIA	Sikes Act Improvements Amendments
HQ	Headquarter	SF	Square Feet
HSM	Helicopter Maritime Strike Squadron	SOCPAC	Special Operations Command Pacific
ICRMP	Integrated Cultural Resources Management Plan	SOI	School of Infantry
IMP	Installation Master Plan	SPIDERS	Smart Power Infrastructure Demonstration
IN	Inches		for Energy Reliability and Security
INRMP	Integrated Natural Resources Management Plan	SY	Square Yard

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Marine Corps Base Hawaii Installation Master Plan Camp Smith Area Development Plan

TECOM Marine Corps Training and Education Command

TSF Training Support Facility
UFC Unified Facilities Criteria
USPACOM U.S. Pacific Command

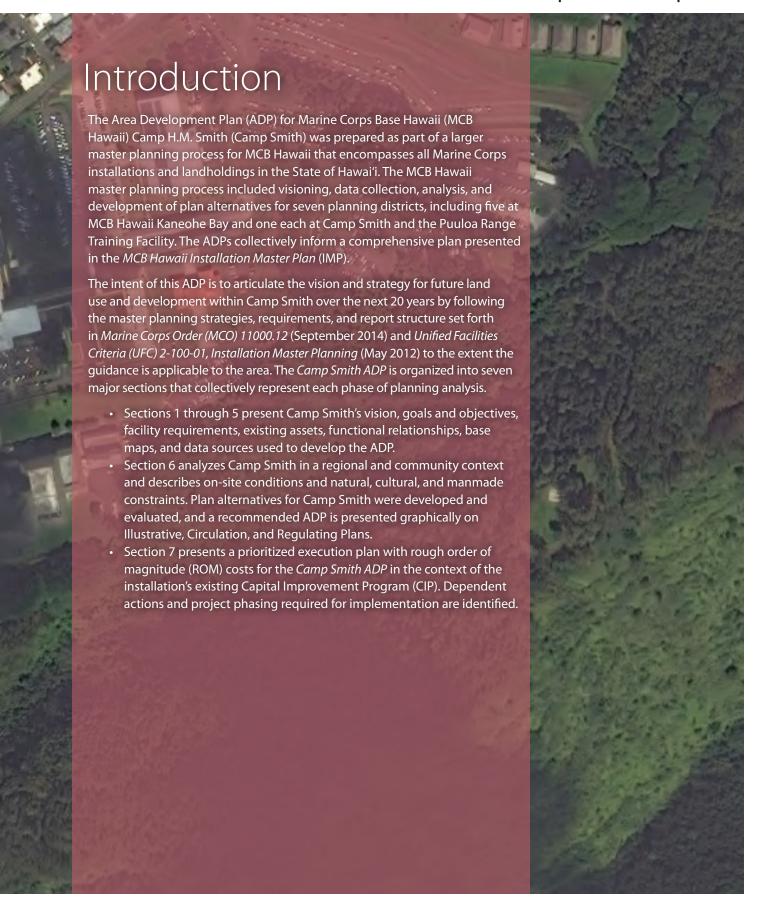
VR Navy Reserve Squadron

WWBN Wounded Warrior Battalion

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Camp Smith Area Development Plan





FOR OFFICIAL USE ONLY Introduction

Camp Smith Area Development Plan



1 Vision, Goals, and Objectives

1.1 Background

Camp Smith is located on the upper slopes of Hālawa Heights approximately six miles north-northwest of downtown Honolulu on the hillside above Pearl Harbor, as shown on Figure 1-1. Camp Smith houses the headquarters of Commander, U.S. Pacific Command (USPACOM), Special Operations Command Pacific (SOCPAC), and Marine Forces Pacific (MARFORPAC). Although the primary function of the installation is an administrative headquarters, supporting uses include warehousing, maintenance, officer family housing, and Bachelor Enlisted Quarters (BEQ). Community support facilities include a location exchange, a swimming pool, a fitness center, tennis courts, and an all hands club.

Camp Smith shares MCB Hawaii's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

District Mission

As part of MCB Hawaii, Camp Smith provides base operating support, integration, and functionality to USPACOM, MARFORPAC, and other components and agencies to facilitate command and control, and promote the safety, well being, and morale of military personnel, their families, and the civilian work force.

District Vision

To create a 21st century, architecturally coherent, functionally efficient, walkable campus, encompassed by its unique natural setting.



1.2 Camp Smith

Camp Smith has its own vision, goals, and objectives that take into consideration its unique mission, functions, location, and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

The planning goals to guide the design and development of Camp Smith include the following.

- Architecturally coherent: Promote a sense of importance through coherent design that reflects the stature of the major commands. Maintain key historic buildings that define the character of the installation.
- **Design efficient facilities:** Modernize aging facilities and infrastructure to increase energy efficiency.
- Walkable campus: Design a campus-like environment that is safe, convenient, and comfortable. Interconnect buildings with well-connected pedestrian networks to enhance walkability and improve wayfinding.
 Provide adequate parking close to work centers.
- **Natural setting:** Redevelop on previously disturbed lands while leaving the gulch areas forested.

The specific planning objectives of Camp Smith ADP include the following.

- Redevelop the aging and inefficient MARFORPAC headquarters
- Consolidate parking in close proximity to work centers
- (b) (7)(F)
- Redevelop Elrod Road into a boulevard to improve pedestrian safety
- Redevelop BEQs into a campus-like setting with adequate parking
- Construct new operations and administrative workspace and demolish Building 20

2 Facility Requirements and Land

This section of the plan establishes the major personnel loading and basic facility requirements (BFR) upon which the Camp Smith ADP is based.

2.1 Area Force Loading

Personnel loading data indicate Camp Smith had a total population of almost 3,200 in FY13, as shown in Table 2-1. This total includes personnel associated with USPACOM, SOCPAC, and other tenant and commands, in addition to Marine Corps loading.

Table 2-1 Projected FY 2018 Force Loading Data for Camp Smith

OFFICER ¹	ENLISTED ¹	CIVILIAN¹	DEPENDENT ²	TOTAL
1,189	1,092	918	0	3,199

¹Officer, Enlisted, and Civilian personnel numbers are from MCB Hawaii's FY08 Facilities Support Requirements document, FY09 Strength Report, and FY13 projected Table of Organization

2.2 Area Equipment Loading

There is no appreciable equipment loading at Camp Smith.

2.3 Facility Requirements

Basic facility requirements for Camp Smith were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies are presented in Table 2-2.

² With minimal community support requirements for dependents, dependents not included in Camp Smith loading.

Table 2-2 Facility Requirements (CCN 11120–73020)

lable 2-2 Facility Requirements (CCN 1			120-/3020)			
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)	
11120	Helicopter Landing Pad/Hoverpoint	SY	1,100	1,110	10	
13115	Communications		33,596	30,439	(3,130)	
13140	Telephone Exchange Building	SF	3,360	4,621	1,261	
14160	Visual Information Facility	SF	5,570	12,627	7,057	
14345	(b) $(7)(F)$					
14365	(0)(7)(1)					
14377	Operational Storage	SF	13,246	6,330	(6,916)	
14378	(h)(7)		F)			
14380	(0)	1				
17110	Academic Instruction Building	SF	2,180	1,883	(297)	
17120	Applied Instruction Building	SF	4,180	4,186	6	
17125	General Purpose Auditorium	SF	4,240	6,140	1,900	
17955	Combat Training Pool/Tank	EA	1	1	0	
21175	Parachute and Survival Equipment Shop (Non-NAVAIR Depot)	SF	8,300	1,603	(6,697)	
21451	Automotive Organizational Shop	SF	1,200	1,434	234	
21710	(b) (3) (A)	A)	, (b)	(7	')(F)	
21910	Public Works Shop	SF	11,700	6,232	(5,468)	
21920	Pavement and Grounds Equipment Shed	SF	525	1,400	875	
44112	Storage of Air or Ground Organic Units for Marine Corps	SF	10,856	11,313	457	
44135	General Storage Shed	SF	252	252	0	
55010	Primary Care Clinic	SF	6,090	5,151	(939)	
61010	Administrative Office	SF	511,091	481,458	(29,633)	
61072	Battalion Squadron Headquarters	SF	12,000	26,832	14,832	
61073	Company Battalion Headquarters	SF	1,930	2,444	514	
61074	Garrison Aid Station	SF	4,410	1,005	(3,405)	
61077	Administrative Storage	SF	16,400	15,698	(702)	
72124	Bachelor Enlisted Quarters - E1/E4	PN	248	244	(4	
73010	Fire Station		7,494	7,150	(344)	
73020	(b) (7)(F)					

Table 2-2 Facility Requirements (CCN 73025–85121)

			,				
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)		
73025	(b) (7)(F)						
73066	Miscellaneous Personnel Weather Shelters	SF	1,351	3,227	1,876		
73075	Public Toilet	SF	500	342	(158)		
73085	Post Office	SF	1,750	1,497	(253)		
74002	Location Exchange	SF	10,071	7,979	(2,092)		
74004	Exchange/MWR Food Service	SF	6,000	4,104	(1,896)		
74009	Exchange Service Outlets	SF	2,800	3,905	1,105		
74013	Exchange Laundry and Dry Cleaning Facility	SF	400	443	43		
74030	Exchange Gas/Service and Auto Repair Station	SF	2,500	1,092	(1,408)		
74044	Indoor Physical Fitness Center	SF	30,894	32,094	1,200		
74047	Information, Tickets, and Travel Office	SF	780	440	(340)		
74054	MWR Military Recreation Center	SF	7,100	5,518	(1,582)		
74060	Commissioned Officer's Club	SF	8,000	7,727	(273)		
74067	All Hands Club	SF	8,600	12,544	3,944		
74076	Library	SF	3,610	3,476	(134)		
74078	Recreation Pavilion	SF	4,000	300	(3,700)		
74088	Educational Services Office	SF	10,400	6,749	(3,651)		
74089	Bathhouse	SF	1,640	1,125	(515)		
75010	Outdoor Playing Courts	EA	4	6	2		
75020	Playing Fields	EA	2	2	0		
85121	Vehicle Parking, Unsurfaced	SY	2,560	0	(2,560)		
85210	Parking Area	SY	82,495	63,455	(19,040)		

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

2.4 Developable Real Estate

During the planning process, areas throughout the 220-ac installation were assessed for their ability to accommodate future development or redevelopment, and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- Potentially Developable: Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Areas identified as Developable with Constraints include sites where existing facilities are outdated, in poor physical condition, or poorly sited. These sites provide opportunity for infill development. Infill development is the process of developing vacant or under-used parcels within areas that are already largely developed. Infill development results in more compact development patterns, minimizes the need for new infrastructure (and may lower development costs due to proximity to existing infrastructure), and ensures that housing, work areas, and support services are close to one another. This approach supports MCB Hawaii's stated goals to create modern, efficient, and sustainable facilities and to consolidate functions. It also supports the goal of preserving land for training or recreational areas such as parks and green space. The potential availability of areas at Camp Smith for future development is shown on Figure 2-1.

2.5 Installation Assets

Major installation assets at Camp Smith include administrative office and (b) (7)(F)

a 30,000-sf indoor physical fitness center constructed in 2013; a small number of family housing units; and BEQ for 244 people. Bordelon Field is used for recreation, ceremonies, and training, and has a prominent U.S. flag flown over the field that is visible from the surrounding neighborhoods. A newly constructed microgrid power system allows the installation to run independent of the local power company, increasing the independence and stainability of operations. Major facilities and other landmarks at Camp Smith are illustrated on Figure 4-2 in Section 4.0, Base Maps.

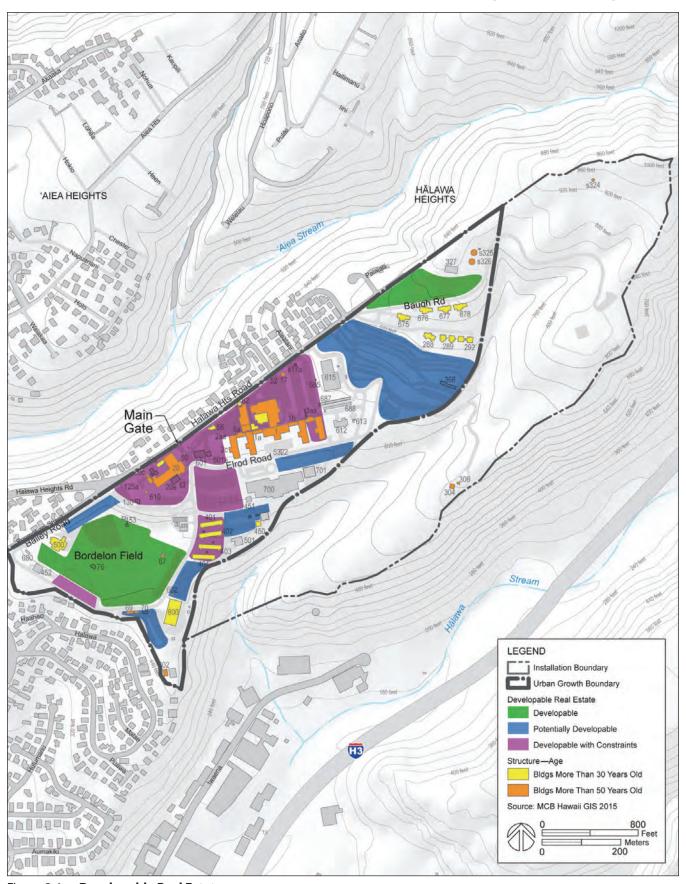


Figure 2-1 **Developable Real Estate**

Camp Smith Area Development Plan



U.S. Marines with U.S. Marine Corps Forces, Pacific, Combat Camera, conduct a mock foot patrol on Camp H.M. Smith, Sept. 16, 2011. Combat Camera Marines conduct simulated patrols to enhance combat readiness and technical and tactical proficiency in a combat environment. (Photo by Kristian Karsten. www.dvidshub.net)

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the functional relationships between major land users at MCB Hawaii installations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant commands, individuals, and their families.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawai'i MAGTF.

The Aviation Combat Element component of the MAGTF construct on Oʻahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on Oʻahu; however, certain internal Command Element functions/units do reside at various locations.

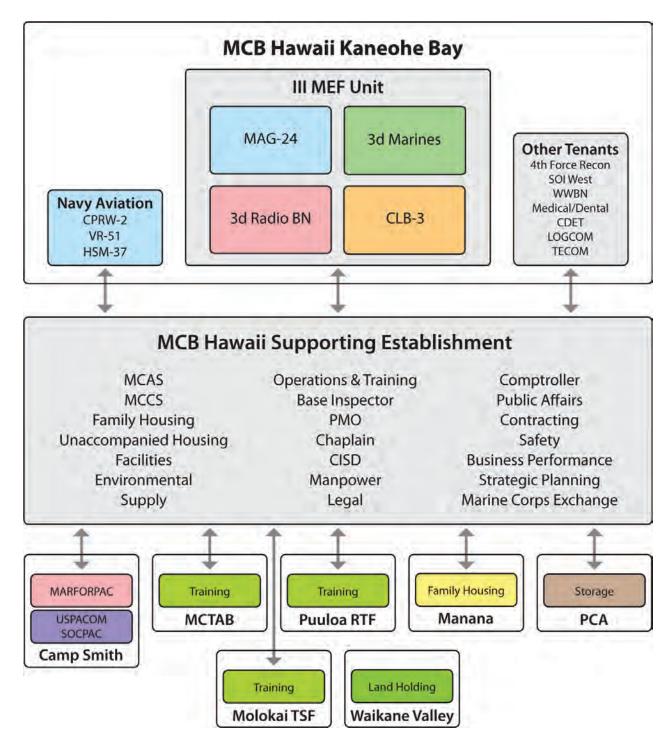


Figure 3-1 MCB Hawaii Functional Relationships

3.2 Camp Smith Functional Relationships

Figure 3-2 illustrates the functional relationships between major commands and land uses within Camp Smith, which includes the USPACOM and MARFORPAC headquarters buildings, a fire station, and other support functions such as family housing, active duty billeting, recreation facilities, a fitness center, and an all hands club.

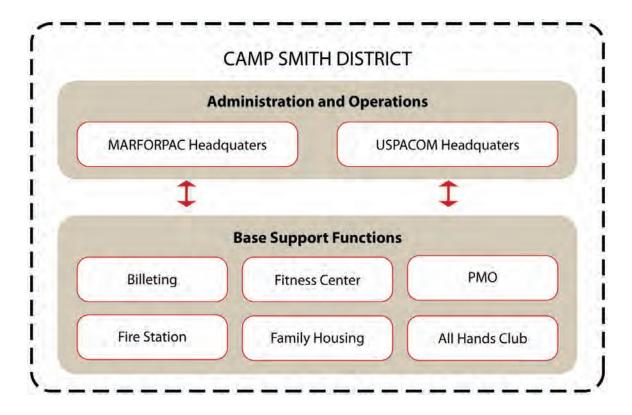


Figure 3-2 Camp Smith Functional Relationships



The Joint Interagency Task Force West (JIATF-W) is Headquartered within the Pacific Commanders Building (Nimitz/MacArthur) on Camp H.M. Smith, Hawaii. (Photo by Capt. Kali Pinckney. www.dvidshub.net)

4 Base Maps

Section 4, Base Maps, shows Camp Smith in the context of the neighboring community (Figure 4-1) and the major facilities and physical geography on site (Figure 4-2).

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Camp Smith Area Development Plan

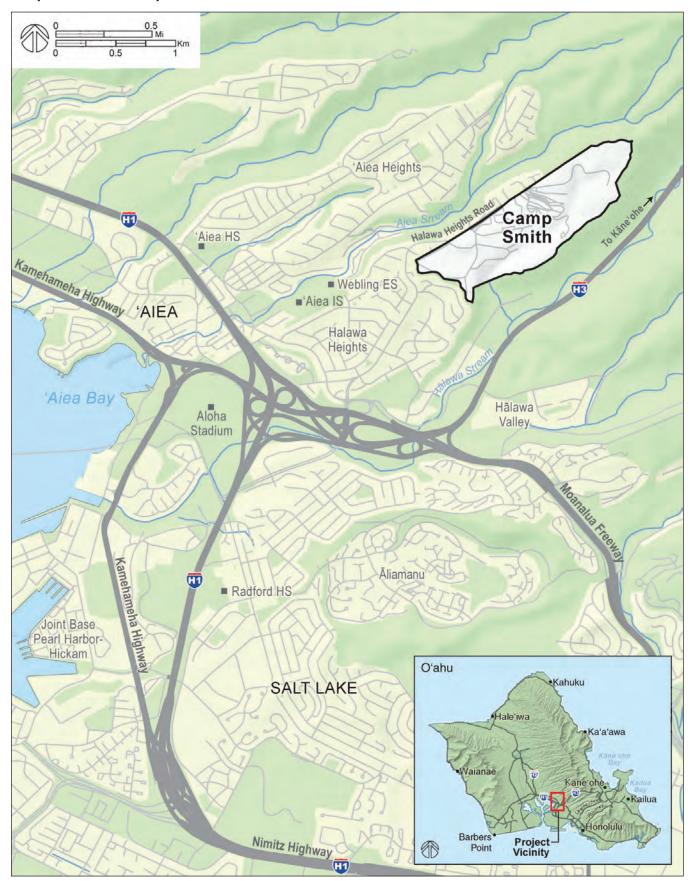


Figure 4-1 Regional Area Map

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Figure 4-2 Major Facilities of Camp Smith

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Marine Corps Base Hawaii Installation Master Plan Camp Smith Area Development Plan

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5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and geographic information system (GIS) and facility databases were all primary information sources contributing to the development of the *Camp Smith ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of each unit or department operating at Camp Smith. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

Marine Corps Base Hawaii. Camp H.M. Smith Parking Study. Ongoing.

The Camp H.M. Smith Parking Study is an ongoing effort to conduct a base-wide study to identify existing parking assets and future parking requirements, develop potential parking improvements, and recommend an overall parking plan for the installation. Although no draft report has been published, the analysis and determinations of the study serve as the basis for the parking recommendations made in Section 6 and Section 7 of this ADP.

Marine Corps Base Hawaii. Camp H.M. Smith Historic Landscape Report. Pre-Final, December 2015.

This Historic Landscape Report was prepared to meet the requirements of the Memorandum of Agreement developed between cultural resource partners through the *National Historic Preservation Act Section 106* consultation process and serves to bring nationally accepted cultural landscape treatment standards to bear on the ongoing management of the installation's landscape, and to accommodate necessary activities and new construction in ways that preserve the area's cultural and historic integrity. The report provides a detailed landscape analysis and evaluation that identifies specific character-defining features, character-defining views, and zones of relative historic landscape integrity, and specifies landscape treatment guidelines and how impacts from new construction may be mitigated.

U.S. Marine Corps Forces, Pacific. Operations Facility Feasibility Study Phase II, Camp H.M. Smith, Oahu, Hawaii. Prepared by HHF Planners. July 2014.

This study developed additional options for an adequate, consolidated, and efficiently configured facility at the current site of the (b) (7)(F)

(b) (7)(F)

(b) (7)(F) The study analyzed four potential development configurations, which included a mix of renovation and new construction. Tenant space

Camp Smith stakeholders included representatives from the following units and departments.

MARFORPAC Headquarters and Services Company

Cruise Missile Support Activity Pacific

Operations & Training Department

Communications Information Systems Directorate

Marine Corps Community Services

Family Housing

Public Works Department

Environmental Department

Facilities Department

Safety Department

Business Performance Office

Marine Corps Installation Command

Naval Facilities Engineering Command

Section 5 | Data Collection

requirements, functional relationships, security requirements, and historic preservation requirements were considered. Project scopes, drawings, and rough order of magnitude costs were developed. One of the four configurations was recommended as best supporting mission objectives.

U.S. Marine Corps Forces, Pacific. United States Marine Corps O'ahu Land Use Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The study investigated the potential for DoD lands on the island of O'ahu to accommodate the Defense Policy Review Initiative proposal to relocate seven units of the III MEF from Okinawa, Japan, to O'ahu between 2026 and 2031.

Department of the Navy, Naval Facilities Engineering Command Pacific. Update to the Integrated Cultural Resources Management Plan, Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is "a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management." The ICRMP is a planning and decision document for cultural resources managers that integrate specific compliance procedures with cultural resources program requirements, ongoing mission activities, and other planning documents and metrics.

Department of the Navy, Naval Facilities Engineering Command Hawaii. Marine Corps Base Hawaii Camp H.M. Smith Accessibility Study, Final. August 2013.

This study developed recommendations that address unsafe pedestrian and vehicular circulation at Camp Smith.

Naval Facilities Engineering Command, Pacific for Commander Navy Region Hawaii. Final Environmental Assessment for Hawaii Joint Services Solar Power Generation. May 2013.

This environmental assessment, prepared in accordance with the National Environmental Policy Act, evaluates a proposal to provide suitable sites on DoD installations in Hawai'i to a private entity for the installation and operation of photovoltaic (PV) systems to reduce the installations' reliance on non-renewable energy. The proposed PV systems would be located on 85 sites located on DoD installations on O'ahu and Kaua'i.

U.S. Marine Corps Forces, Pacific. Operations Facility Feasibility Study Phase I, Camp H.M. Smith, Oahu, Hawaii. April 2012.

This study serves as a resource for decision-making and implementation of military construction (MILCON) project P-818, which will provide upgraded facilities for MARFORPAC, MCB Hawaii Facilities Department, Camp Smith Facilities Division, and Marine Corps Community Services (MCCS). Project P-818 will upgrade the Building 1 complex and provide facilities that are operationally efficient and in compliance with current design initiatives and building and safety standards. Current challenges include an inefficient building configuration, inadequate utility systems, and a lack of swing space.

Marine Corps Base Hawaii, Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

This plan provides an update of the original 2001 MCB Hawaii INRMP/EA and the first update (2006). It is intended to guide implementation of the MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

This master plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii Kaneohe Bay. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

Department of the Navy, Naval Facilities Engineering Command Pacific, Planning and Base Development Department. Marine Corps Base Hawaii Main Gate Improvements at MCB Hawaii Camp H.M. Smith. 2004.

This study provides design measures that would bring the physical security capabilities of the Camp Smith ECP up to acceptable standards as defined in the Interim Technical Guidance Entry Control Facility (February 2003) and Unified Facility Criteria DoD Minimum Antiterrorism Standards for Buildings (October 2003). The study contains 14 alternative gate concepts at various locations along Halawa Heights Road.

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Camp Smith Area Development Plan



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6 ADP Area Analysis

Section 6 presents the regional and onsite conditions related to Camp Smith. Section 6.1, Regional Context, describes the neighboring civilian community. Section 6.2, Onsite Conditions, describes the general physical characteristics of Camp Smith as well as the existing conditions and manmade, natural, and cultural resources constraints of the installation. A recommended ADP is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

Camp Smith covers of 220.5 ac of land on the upper slopes of Hālawa Heights overlooking Joint Base Pearl Harbor-Hickam, and is approximately six miles north–northwest of downtown Honolulu. The installation is divided into two main ridges by a deep, 60-ac gulch which runs northeast to southwest. The developed portion of the installation, approximately 110 ac, is on the western ridge and includes a 3.6 ac family housing area. The eastern ridge includes a helicopter landing pad and a former recreation area. A large portion of Camp Smith is forested and undeveloped and includes the upper drainage of the North Hālawa Stream watershed.

Surrounding land uses include private residential and commercial areas to the northwest and southwest, including 'Aiea Heights and Hālawa Heights. The installation is bounded to the northeast by the undeveloped slopes of the Ko'olau mountains and a forest reserve to the east and south. Keaīwa State Park is contiguous to the northern boundary of Camp Smith.

The nearest town is 'Aiea, located downslope of Camp Smith, at the bottom of Hālawa Heights Road. According to the 2010 census, 'Aiea had a population of 9,338. The highly industrialized Hālawa Valley is located south of Camp Smith (Marine Corps Base Hawaii, 2011).

A regional base map (Figure 4-1) is presented in Section 4, Base Maps.

6.2 Onsite Conditions

6.2.1 Geology

Camp Smith is located on the west side (leeward) of the Koʻolau mountain range on a sloping, spurred ridge cut by erosion. The Koʻolau range was formed from the Koʻolau volcano, believed to have first erupted on the ocean floor more than 2.5 million years ago. Over hundreds of thousands of years, the volcano reached sea level, and the smooth slopes of the shield volcano eroded and subsided considerably. What remains of Koʻolau today is the western half of the original volcano that was destroyed in prehistoric times when the entire eastern half—including much of the summit caldera, slid cataclysmically into the Pacific Ocean (Department of the Navy 2006).

6.2.2 Topography

The topography of Camp Smith is steep and irregular with elevations ranging from approximately 400 ft on the south end to 1,000 ft on the northern end. Approximately half of the installation is comprised of ravines and steep slopes. The large gulch, which runs through the property, includes rocky slopes greater than 30 percent. The eastern and western ridges on either side of the gulch have gentler slopes. The developed areas of the installation are mostly on the western ridge, where most buildings have been constructed on manmade terraces. The eastern ridge has relatively small pockets of developable land. Overall, the natural topography of Camp Smith severely constrains development (Department of the Navy 2006).

6.2.3 Hydrology

Camp Smith is within the upper drainage of the North Hālawa Stream watershed. The North Hālawa Stream is a perennial stream located to the southeast of Camp Smith, flowing from the upper reaches of the Koʻolau mountains and empties into the east loch of Pearl Harbor. The watershed area encompasses 9.8 square miles.¹

6.2.4 Soils

Soil types at Camp Smith are shown on Figure 6-1. The majority of the installation consists of well-drained soils from the Manana and Helemano series. Silty clay loams belonging to the Manana series (MoD2) are found on the moderately steep slopes in the northeast portions of both the eastern and western ridges, and are subject to rapid runoff and are a severe erosion hazard. Silty clays, also of the Manana series (MpB, MpC), occupy gentle slopes in the northwest portion of the installation, and are subject to slow runoff and a slight erosion hazard. Moderately permeable silty clays of the Helemano series (HLMG) are located in the upper gulch, and are subject to medium to very rapid runoff and are a severe to very severe erosion hazard (Department of the Navy 2006).

The lower gulch and areas bordering the installation to the north and south are characterized as Rock Land (rRK), with exposed rock covering 25 to 90 percent of the surface. The soil material associated with the rock outcrops is very sticky and very plastic and has a high shrink-swell potential. Buildings on steep slopes are susceptible to sliding when the soil is saturated and foundations and retaining walls are susceptible to cracking.

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer

¹ Atlas of Hawaiian Watersheds and Their Aquatic Resources, April 7, 2008. http://www.hawaiiwatershedalas.com/watersheds/oahu/34002.pdf.

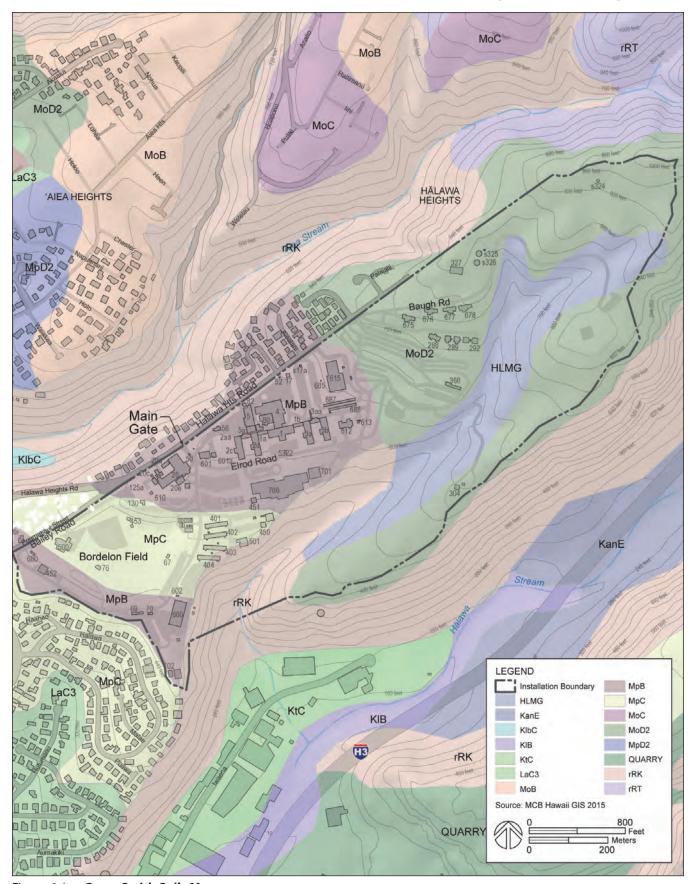


Figure 6-1 Camp Smith Soils Map

(May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild tradewinds, while winter has higher rainfall, cooler temperatures, and stronger tradewinds. The predominant wind direction in the Hawaiian Island is from the east-northeast at 10 knots.

In the Hālawa Heights area, monthly average low and high temperatures range from 72 to 88 degrees Fahrenheit in the summer months (July to September) and from 64 to 80 degrees Fahrenheit during the coolest month (February).

6.2.6 Vegetation

The majority of vegetation within Camp Smith is comprised of non-native species. The areas with natural vegetation consist of an open guava forest with shrubs typical of areas with 40 to 60 in of annual rainfall and elevations up to 2,500 ft. The developed western ridge area contains many trees commonly used in landscaping, including Chinese banyan, monkeypod, elephant ear, and brassia (umbrella) trees. Prior to development, the installation was used for sugarcane production, and as such, it has been cleared of its original native vegetation. No federal- or state-listed threatened or endangered floral species have been identified within Camp Smith (Department of the Navy 2006).

6.2.7 Land Use

Figure 6-2 illustrates land use at Camp Smith. Almost all development is concentrated on the western ridge and is predominantly administrative in nature. Other uses within this developed area include: officer family housing located on a slope above the central built up area; bachelor quarters and personnel support uses—such as recreation and club facilities—primarily located on the lower southwestern area; and maintenance and storage areas located at the southernmost portion of the ridge.

Surrounding areas that are constrained by steep slopes are undeveloped or used for passive recreation or training. The eastern ridge includes an operational area with a helipad.

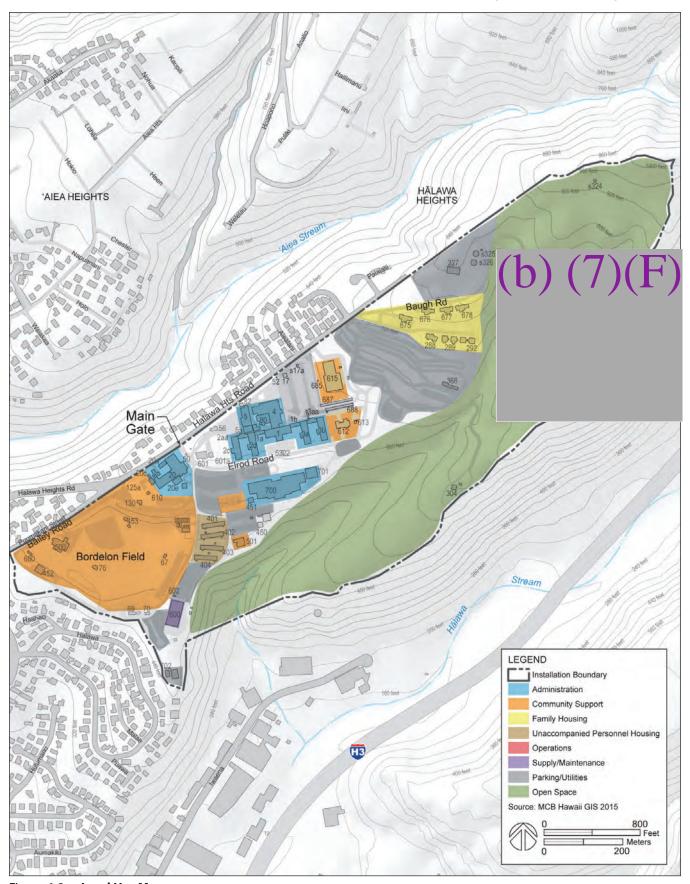


Figure 6-2 Land Use Map

6.2.8 Transportation Network

Figure 6-3 shows the roadway network within Camp Smith. The main gate is located off Halawa Heights Road and the entry road bears to the left becoming Elrod Road, providing access to the Building 1 complex and USPACOM headquarters in Building 700. Bailey Road branches south from the main entry road and loops around Bordelon Field. These two primary roads are each two lanes wide, although some sections are narrow, steep, and winding. Traffic congestion is common in the area around the Building 1 complex.

Parking areas are concentrated in the southwest and northeast sections of the installation. A significant portion of parking is provided on terraced driveways cut into the hillside upslope of the Building 1 complex. Conveniently located parking is limited.

Camp Smith is accessed via Halawa Heights Road, which rises up the ridge and passes along the northwest boundary. The nearest interstate is H-1 via the Moanalua Freeway (Route 78), which can be accessed at the base of Halawa Heights Road, approximately one-half mile to the southwest. The Moanalua Freeway connects to the H-1 Freeway, the primary highway running between east and west O'ahu. Interstate H-3 (John A. Burns Freeway), which crosses the Ko'olau mountain range and connects Honolulu with windward O'ahu, provides a direct route to MCB Hawaii Kaneohe Bay. Interstate H-3 originates just east of Camp Smith and can be accessed via interchange from the Moanalua Freeway.

Oahu Transit Services provides county bus service to Camp Smith. Regular off-base service is provided by Route 74 with multiple stops located along Halawa Heights Road. Service is provided twice in the mornings and twice in the afternoons on weekdays only.

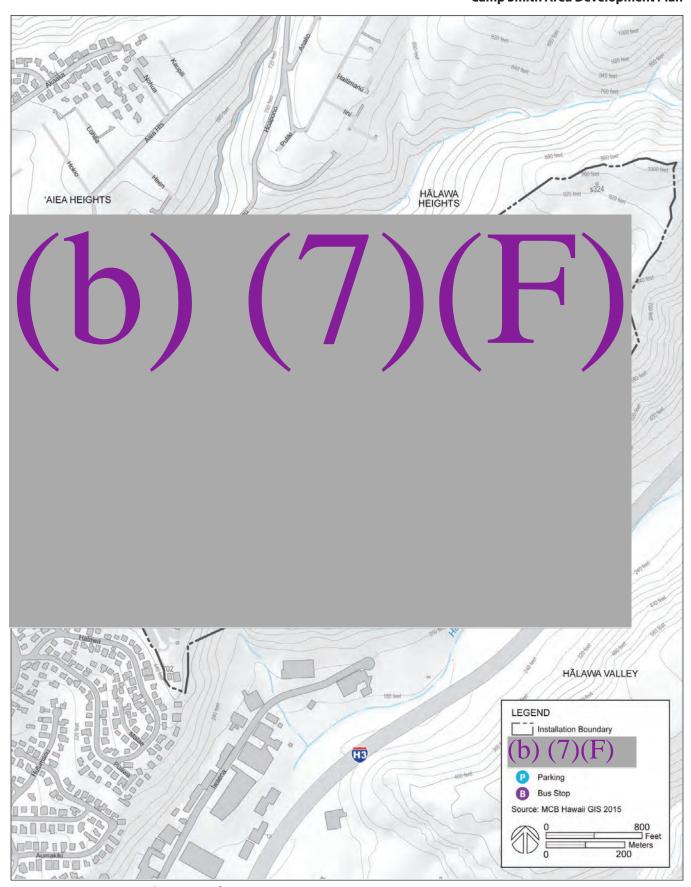


Figure 6-3 Transportation Network Map

6.2.9 Utilities

Water

Potable water at Camp Smith is obtained from the Navy's Pearl Harbor water system, which is owned and operated by NAVFAC HI and illustrated on Figure 6-4. The distribution system includes one 400,000-gallon tank and two 200,000-gallon tanks. A 50,000-gallon storage tank at the northern end of the camp is no longer in use. The water supply system is also connected to the City and County of Honolulu Board of Water Supply (BWS) system in Hālawa for back-up service.

Wastewater

The wastewater system at Camp Smith is owned, operated, and maintained by NAVFAC HI, and is shown on Figure 6-5. The system consists of a series of gravity lines that convey domestic sewage to the Navy's Pearl Harbor system. From there, it is conveyed to the Fort Kamehameha Wastewater Treatment Plant for advanced secondary treatment, with effluent discharged into Mamala Bay through a deep ocean outfall. Currently, the Fort Kamehameha Wastewater Treatment Plant has reached its capacity and can receive no additional wastewater from Camp Smith.

Electrical

Camp Smith purchases commercial power from Hawaiian Electric Company (HECO) via NAVFAC HI. Power is received at the HECO Substation located at the southwestern corner of Camp Smith at 46 kV and is stepped down to 11.5 kV, with two circuits feeding the on-base Station R next to the HECO substation. Power is further transformed to 2.4 kV by two 1,500-kVA transformers prior to distribution. The electrical distribution system, illustrated on Figure 6-6, is owned, operated and maintained by NAVFAC HI (Department of the Navy 2006).

In 2013, a final environmental assessment and finding of no significant impact were issued for MCB Hawaii to expand ground and rooftop-mounted PV in nonfamily housing areas in partnership with NAVFAC HI. Building 80, Building 615, and the carports around Building 615 currently have PV installed. Two projects have been awarded for PV installation on Building 600 and over the parking lot next to the BEQ. Locations of existing and proposed PV installation at Camp Smith are also shown on Figure 6-6.

Camp Smith recently completed a demonstration project called Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS). The

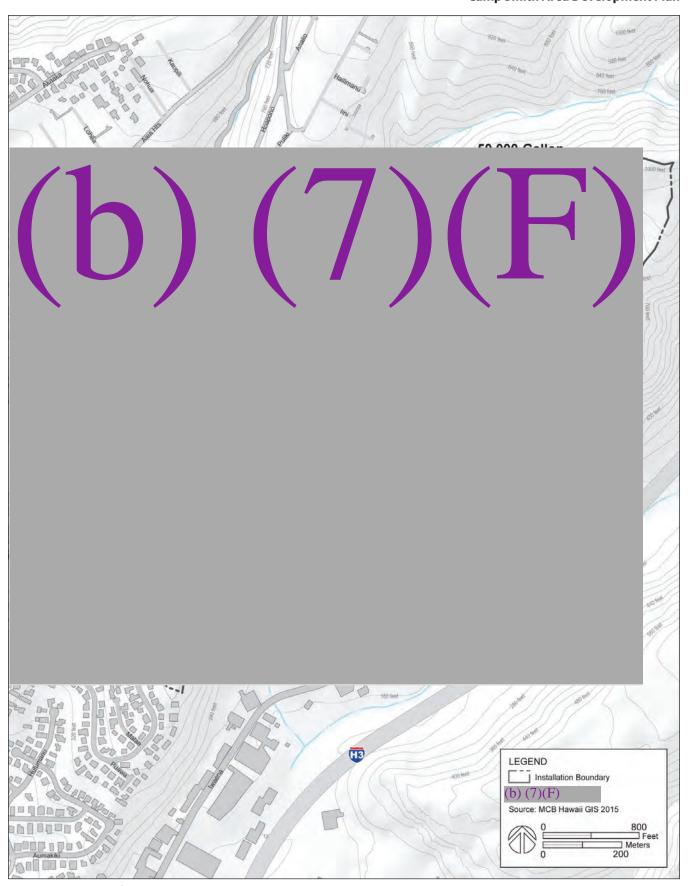


Figure 6-4 Water System

Camp Smith Area Development Plan

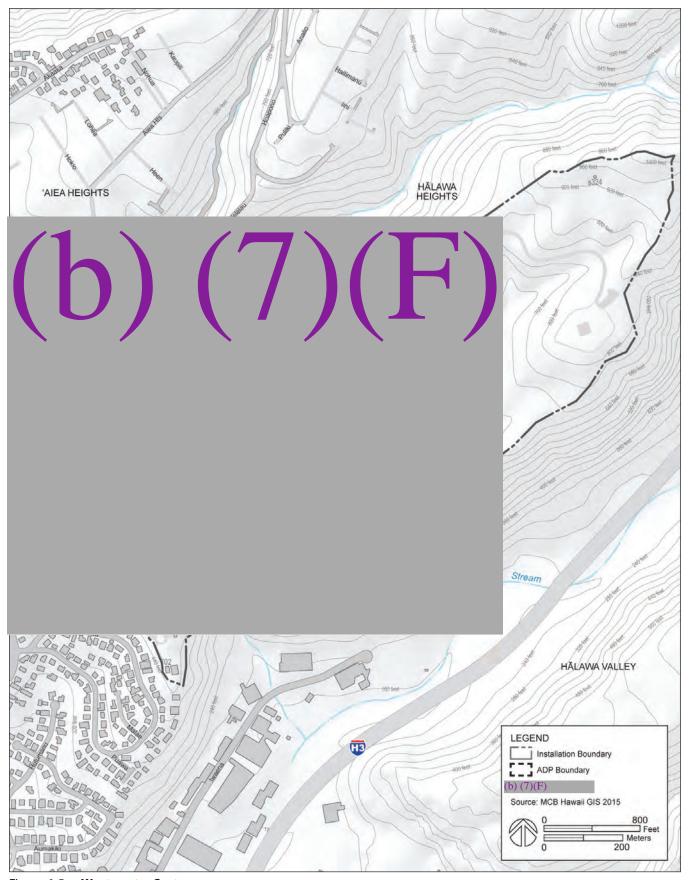


Figure 6-5 **Wastewater System**

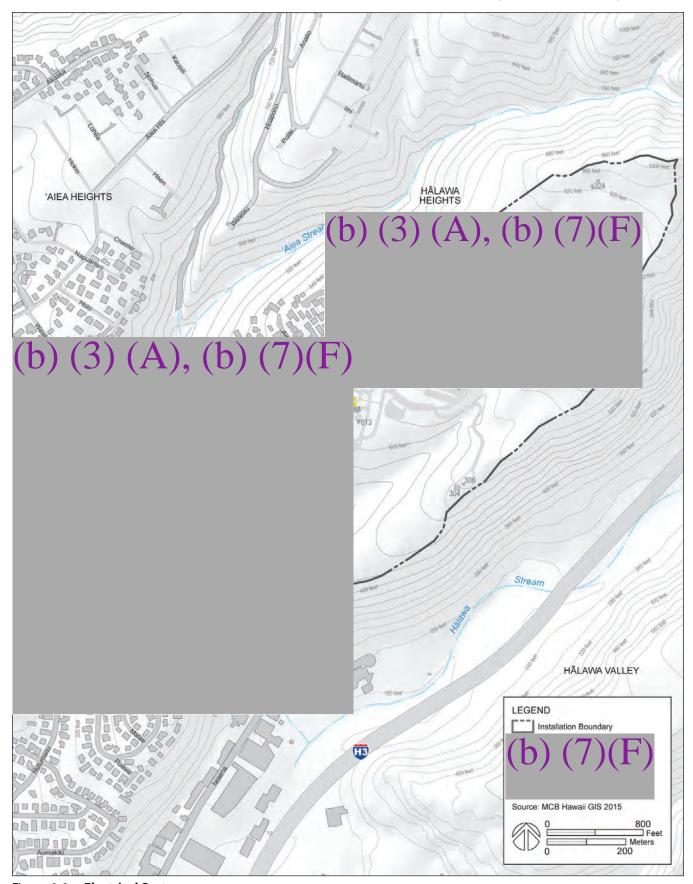


Figure 6-6 **Electrical System**

Stormwater Management System

As described in the Stormwater Drainage Study for Camp Smith (March 2013), the installation contributes stormwater runoff to two separate streams and drainage basins. The majority of stormwater flows south via drainage intakes that lead to the ravine and eventually feed the North Hālawa Stream tributary; select areas adjacent to Halawa Heights Road discharge to a utility easement maintained by NAVFAC HI and owned by the City and County of Honolulu. Surface drainage from the utility easement discharges to a County municipal stormwater system and eventually to 'Aiea Stream. The existing stormwater drainage system has been developed and fixed unsystematically over time—with some sections over 70 years old—which has lead to a growing number of deficiencies.

Solid Waste Disposal

The collection of solid waste at Camp Smith is provided by a private contractor under contract to NAVFAC HI. The contractor provides dumpsters of various capacities in designated locations and disposes of the material at the municipal H-Power facility at Campbell Industrial Park and the Waimānalo Gulch Sanitary Landfill.

6.2.10 Environmental Conditions and Hazards

Environmental conditions and hazards at Camp Smith are shown on Figure 6-8 and described as follows.

Flood Plain

Camp Smith is located within flood hazard Zone D, defined by the Federal Emergency Management Agency as an area outside of the 100-year flood plain and where flood hazards are undetermined but possible.

Wetland

No wetland areas have been identified at Camp Smith.

Wildlife Habitat

Although there are no identified wildlife habitats at Camp Smith, the upper and lower slopes of the installation are densely vegetated. According to the INRMP, the state-listed endangered Hawaiian endemic short-eared owl or *pueo* (*Asio flammeus sandwichensis*) may occasionally use the surrounding areas for hunting and loafing. A remnant native Hawaiian forest bird community, including the 'amakihi (Hemignathus chloris) and the 'apapane (Himiatione sanguinea), is known to occur in the upper forested areas of Camp Smith, and the indigenous migratory Pacific golden plover or kōlea (Pluvialis fulva) occurs seasonally on the grounds. The majority of birds observed within the installation are non-native species. Dominant wildlife species are introduced. No other federal-or state-listed threatened or endangered faunal species have been identified at Camp Smith.

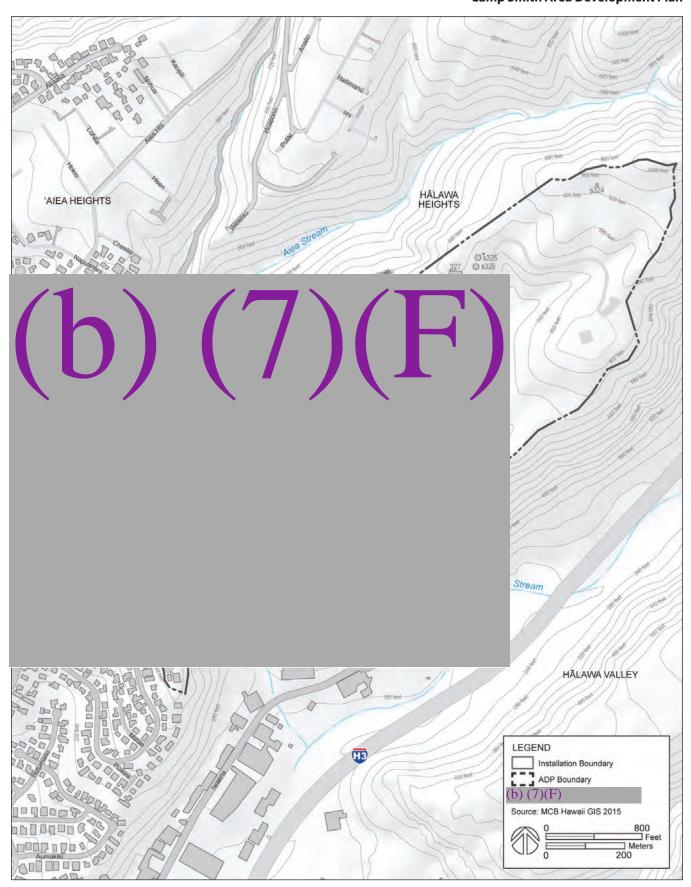


Figure 6-7 **Stormwater System**

Installation Restoration Program and Munitions Response Program

There are two Installation Restoration Program (IRP) sites at Camp Smith. Site 00010 is an old pistol range located at the far northeastern end of the property. Site 00001 is located at the far southwestern end of the property. This site requires no further IRP action, but restrictions may apply if the area is developed. In addition to the IRP sites, there is one Munitions Restoration Program site, located near the helipad, where further action is recommended.

Safety Hazards



Radio transmitters radiate levels of electromagnetic radiation (EMR) that may be hazardous to personnel and fuel. The last complete EMR analysis for Camp Smith was conducted by Naval Electronics Engineering Activity Pacific in September 1991. EMR levels were measured around high frequency transmitters and various antennas. Hazards of electromagnetic radiation to personnel criteria were exceeded within 1–3 ft from certain antennas. Recommendations to minimize personnel EMR hazards include the posting of signs warning personnel with access to the antennas and silencing transmitters while performing maintenance work on the antennas. All EMR levels measured near fuel sites, including the propane tank behind Building 1 and the Exchange gas station, were well below the fuel hazard criteria. Numerous individual antenna installations have been studied at Camp Smith since 1991. However, the overall EMR analysis has not been updated.

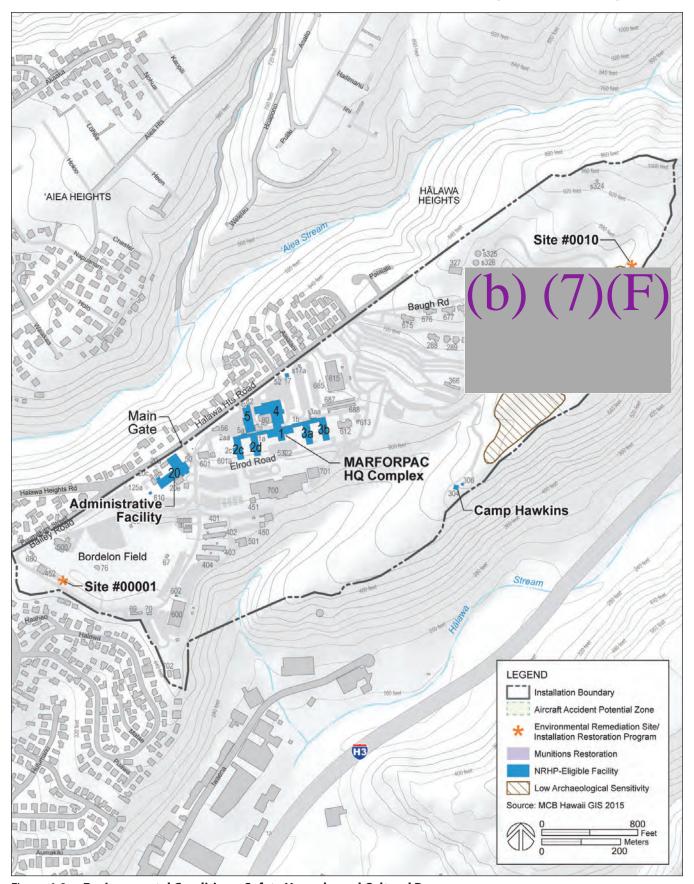


Figure 6-8 Environmental Conditions, Safety Hazards, and Cultural Resources

6.2.11 Archaeological and Historical Architectural Resources

Archaeological Resources

According to the ICRMP, during the pre-Contact period, upland ridge areas—such as the area of Camp Smith—were rarely used in ways that would have left substantial archaeological remains. In addition, historic activities such as cattle grazing, sugar cultivation, and military actions appear to have destroyed any traditional Hawaiian or historic period archaeological sites that may have been present. Two areas on the north eastern boundary, shown on Figure 6-8, are identified as having a low probability for cultural resources.

Historic Architectural Resources

There are 13 buildings at Camp Smith that have been recommended as eligible for listing on the National Register of Historic Places (NRHP). These buildings are identified on Figure 6-8.

The Building 1 Complex consists of nine buildings that comprise the former Aiea Heights Naval Hospital, one of the largest in the world during World War II. The nine buildings (Buildings 1, 1A, 1B, 2AA, 2C, 2D, 3A, 3B, and 3AA) are eligible for the NRHP based on their association with World War II and the construction activities in Hawai'i of the early period of the war; their relationship to the war patients interned at the base; and their association with the noted local architect C.W. Dickey. Building 20 is also considered eligible as a structure associated with the hospital era. Buildings 80, 81, and 82 are eligible for listing on the NRHP for their association with key Cold War missions. These buildings were constructed as a new command operations center complex at the height of the Vietnam War in 1967.

Shangri-La (Building 306) is a recreation pavilion that was constructed by the patients of the hospital as a rehabilitation project in 1943. It is a "significant symbol of the important program that was utilized at the hospital to rehabilitate the wounded."

In response to a proposal to demolish and rehabilitate eligible buildings for a new MARFORPAC Operations and Joint Command complex, a Memorandum of Agreement was signed among MCB Hawaii, the Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation. The agreement contains stipulations including the development of a historic landscape report that specifies treatment guidelines for character-defining landscapes, features, and views.

6.2.12 AT/FP Physical Security

Antiterrorism/force protection (AT/FP) guidelines dictate separation distances between installation perimeters, roadways, and parking. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-1*, *Installation Master Planning* (May 2012). Figure 6-9 shows standoff distances required for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries. (b) (7)(F)

In addition to stand-off distances, (b) (7)(F)
(b) (7)(F)
in UFC 4-022-01, Security Engineering: Entry
Control Facilities/Access Control Points (May 2005). The MCB Hawaii Main Gate
Improvements at MCBH Camp H.M. Smith (2004) identifies the design deficiencies



Gate 3 (Echo Gate), located off Halawa Heights Road, is only open during peak traffic hours. There are seven other locked gates along Halawa Heights Road that are only opened when required.

6.2.13 Sources of Air, Noise, and Light Pollution

There are no heavy industrial operations at Camp Smith which emit high levels of air pollutants. There are no noise generating activities and no sources of light pollution at Camp Smith.

Camp Smith Area Development Plan

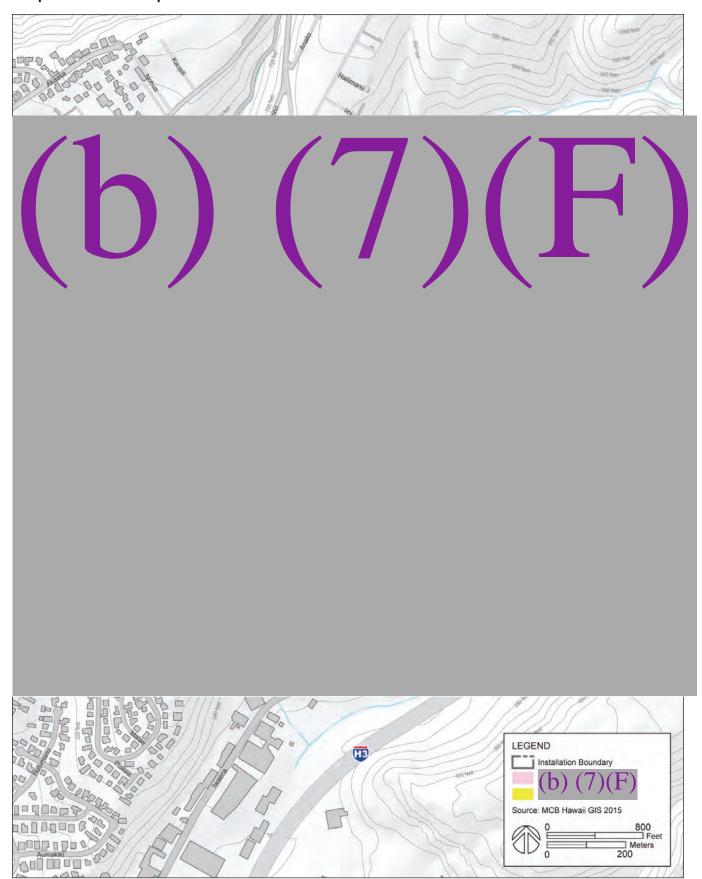


Figure 6-9 AT/FP and Physical Security Map

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6.3 Alternative Site Development and Evaluation

Alternative site development plans were created through a multi-step process involving key installation stakeholders and included representatives from MCB Hawaii departments, operational commands, and other supporting elements. A four-day charrette allowed participants to develop a variety of possible planning actions to address identified facility and land use issues at Camp Smith, including the following.

- · Improve vehicular and pedestrian network connections
- · Site optional locations for parking structure
- Site optional locations for ops/admin building (100,000 sf)
- · Site optional locations for BEQ
- · Identify options for Building 20
- Identify new main gate/ECP location

These concepts were revised and presented as alternatives to stakeholders at a three-day concept workshop where they were further evaluated. Subsequent to the concept workshop, a revised and preferred alternative for Camp Smith was presented to MCB Hawaii leadership and is reflected in the ADP presented in Section 6.4. The *Charrette Summary Report* and *Concept Workshop Report* (IMP Appendices A and B, respectively) thoroughly document the attendees, planning concepts, plan alternatives, and evaluation of the alternatives during the plan development process.

6.4 Area Development Plan

The following section presents the ADP for Camp Smith. ADPs support the overall installation planning vision and goals while providing more detailed plans to achieve specific goals and objectives. Future development envisioned for Camp Smith is reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan. Specific landscape treatment guidelines presented in the *Camp H.M. Smith Historic Landscape Report, Pre-Final* (December 2015) should be included as project scopes are further developed to mitigate new construction impacts on the historic landscape.

6.4.1 Illustrative Plan

The Illustrative Plan graphically portrays planned, programmed, and recommended future development that supports the overarching planning goals for Camp Smith. The Illustrative Plan (Figure 6-10) presents a strategy to redevelop inefficient buildings, improves the security of the main gate ECP, provides adequate parking at convenient locations, expands the pedestrian network, and redevelops the BEQ. Important plan features are described in detail as follows.

Administrative and Operations Center Upgrades (P-818 and P-819)

MILCON project P-818 was originally scoped in 2004 to develop upgraded facilities to accommodate the Camp Smith requirements of MARFORPAC, MCB

Hawaii Facilities Department, Camp Smith Facilities Division, and MCCS. In 2009, the Navy developed another plan to consolidate the dispersed operations of SOCPAC and JIATF-W into a new facility adjacent to Building 700 at Camp Smith (P-050). In 2014, the *Camp H.M. Smith MARFORPAC Operations Facility Feasibility Study, Phase II* evaluated courses of action to demolish, renovate, and reconstruct portions of the historic Building 1 complex (which includes Buildings 1, 1A, 1B, 2AA, 2C, 2D, 3A, 3AA, 3B, 4, 5, 5A, 6, 80, 81, and 82) to meet the combined requirements of both projects. That analysis resulted in the identification of a preferred alternative (COA 2) implemented over three phases.

Currently, due to funding realities and the potential interest of SOCPAC to pursue consolidating on Ford Island, the project is again being tracked as two MILCON projects: P-818 and P-819. As currently scoped, project P-818 (Phase I) provides for the Marine Corps requirements in renovated (Buildings 1, 1A, 1B, 2AA, 2D, and 3A) and newly constructed (on the Building 4 site) administrative and operation center workspaces, and also includes the construction of a four-story, 496-stall parking structure on the current site of the MCCS exchange service station. Project P-819 (Phase II) provides administrative and operation center workspaces for SOCPAC and JIATF-W through new construction (Building 5/5A site) and the renovation of Building 80. This plan proposes that other functions currently in Building 20, including the National Security Agency's Central Security Service Pacific (NCPAC) and the Cruise Missile Support Activity (CMSA), be included in the P-819 scope to allow for the eventual reuse of the



(b) (7)(F) , and meet current *UFC 4-022-01*, *Security Engineering: Entry Control Facilities/Access Control Points* (May 2005) guidelines.

Parking Upgrades

In addition to the P-818 parking structure, a second parking structure is proposed to completely address the Camp Smith parking shortfall. The *Camp H.M. Smith Parking Study* planning effort identifies the southeast corner of the Bailey Road and Elrod Road intersection as the preferred location for a 710-stall, multi-level parking structure to be constructed partially underground to minimize visual impacts. A 80-stall surface lot is also proposed off of Bailey Road by Building 451.

BEQ Campus

A four-building BEQ campus is proposed on existing upper terrace parking lots to replace the existing facilities that are 46 years old over the long-term. The multi-story facilities will accommodate 248 bed spaces, and a recreation facility and dedicated surfing parking lot will also be provided. The relocation of these facilities allows for the existing site to be reused for administrative buildings.



Figure 6-10 Camp Smith Illustrative Plan

Marine Corps Base Hawaii Installation Master Plan Camp Smith Area Development Plan

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Pedestrian Network Improvements

As future development occurs at Camp Smith, new sidewalks are proposed to ensure safe pedestrian access to work and support centers. Remove street parking from Elrod Road, and redesign it into a boulevard with a median strip to provide safer crossings and wider sidewalks between the MARFORPAC Operations Center and USPACOM Headquarters.

6.4.2 Regulating Plan

The Regulating Plan provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes minimum and maximum building heights (floors) to appropriately increase development density at Camp Smith. The building height guidelines intend to maximize the development potential of the installation's finite land resources at a scale appropriate for the proposed building types and uses while being sensitive toward limiting visual impacts.

The Regulating Plan for Camp Smith continues the existing administrative, base support, billeting, and recreational uses and identifies appropriate design characteristics and uses for infill development areas. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01*, *Installation Master Planning* (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)
- Medical Building Types (medical centers and clinics)
- Commercial Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, a bowling alley, and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.4.3 Circulation and Parking Plan

The overall goal of the Camp Smith Circulation and Parking Plan is to improve vehicular flow and pedestrian safety, reduce the amount of surface parking while providing the required number of stalls, and increase walkability and bicycle riding throughout the installation. Parking structures are proposed near the Building 1 Complex and Building 700 to consolidate parking near major work centers and address existing parking stall shortfalls. Converting Elrod Road to a divided boulevard will provide pedestrians safer mid-block crossings. Sidewalks are proposed from parking areas and structures to major work centers.

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Marine Corps Base Hawaii Installation Master Plan

Camp Smith Area Development Plan

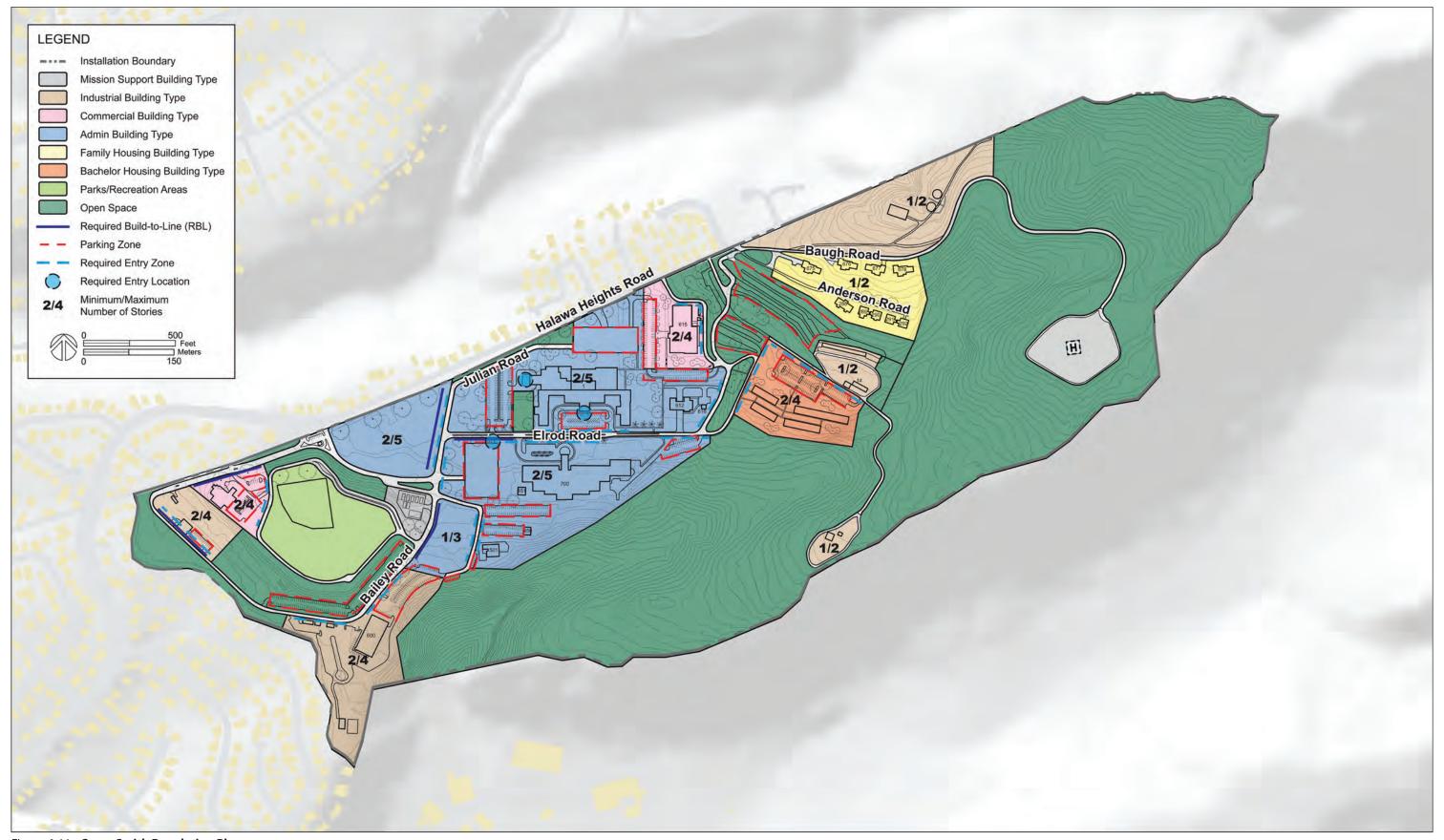


Figure 6-11 **Camp Smith Regulating Plan**

Marine Corps Base Hawaii Installation Master Plan

Camp Smith Area Development Plan

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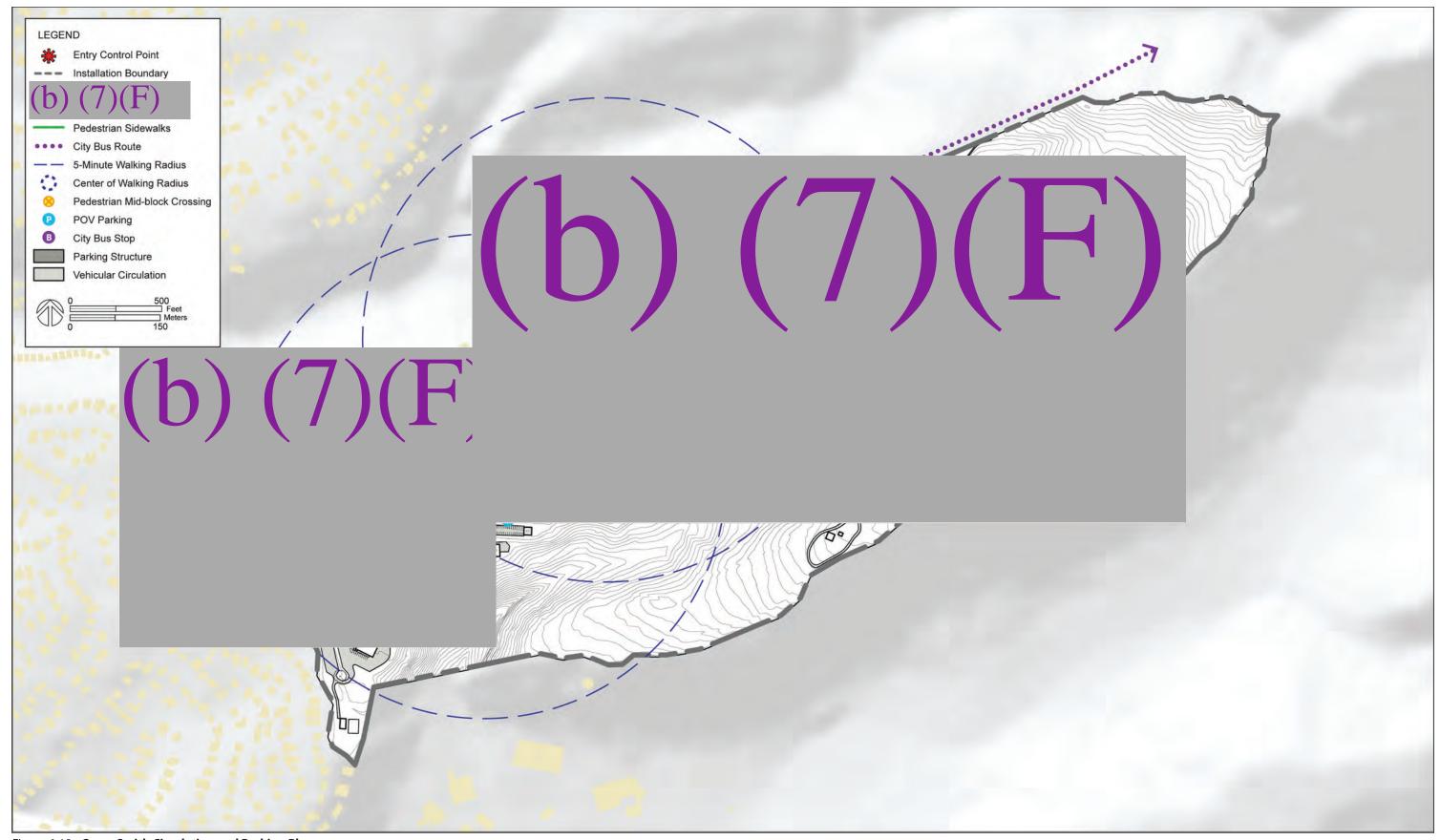


Figure 6-12 Camp Smith Circulation and Parking Plan

Marine Corps Base Hawaii Installation Master Plan

Camp Smith Area Development Plan

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7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Camp Smith ADP* presented in the context of the installation's existing CIP. Dependent actions and project phasing required for implementation are identified. The plan is presented graphically on Figure 7-1 and detailed in Table 7-1, which describes each planning action including any required demolition or other dependent actions.

The timeframe of each planning action is classified as short-term, midterm, or long-term to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP. Short-term actions consist primarily of existing projects developed as part of the Installation's current five-year Program Objective Memorandum program of which none are programmed for Camp Smith. Midterm actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D. Modifications to the scope of existing projects are noted and list an updated ROM cost where appropriate.

Table 7-1 **Summary of Proposed Development Actions**

MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE AND DESCRIPTION	ROM COST (\$K)
1	Mid-term	P-818 Modified	MARFORPAC Operations Facility Phase I Construct new headquarters and operations facility (80,000-sf) Scope and cost modified to include 4-story, 496-stall parking structure	(b) (5)
2	Mid-term	P-878 Modified	(b) $(7)(F)$	
3	Mid-term	P-809 Modified	Camp Smith Parking Upgrades • 7-story, 710-stall parking structure • 80-stall surface parking lot • Location and size per 2016 Camp Smith Parking Study analysis	
4	Long-term	P-819 Modified	(b) (7)(F)	
5	Long-term	Proposed	BEQ Replacement Construct four multistory BEQ and 126-stall at-grade parking lot	
6	Long-term	Proposed	Elrod Roadway Improvements From Bailey Road to east of Building 1	

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Marine Corps Base Hawaii Installation Master Plan

Camp Smith Area Development Plan

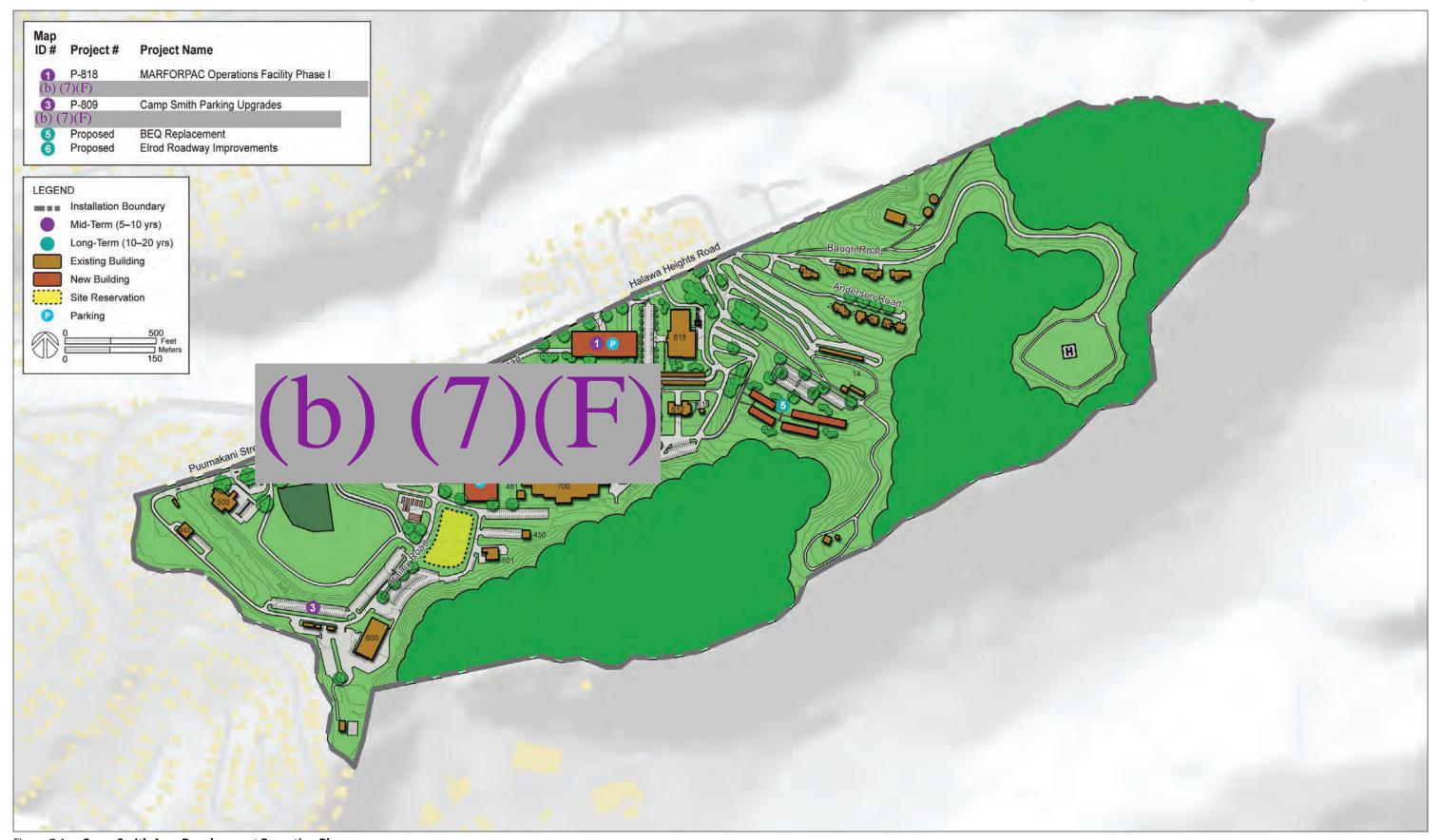


Figure 7-1 **Camp Smith Area Development Execution Plan**

Marine Corps Base Hawaii Installation Master Plan	
Camp Smith Area Development Plan	

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7.2 Demolition Plan

Figure 7-2 highlights facilities proposed for demolition at Camp Smith. These facilities have either exceeded their economic life and require replacement, are excess and no longer need to meet space requirements, or need to be relocated to support other development actions. Details of each facility are provided in Table 7-2.

Table 7-2 **Summary of Proposed Demolition**

Table 7-2 Summary of Proposed Demontion						
FACILITY NUMBER	FACILITY USE	AREAS (SF)	FACILITY AGE	YEAR BUILT		
2C	Admin/Instruction Space/Post Office	35,494	73	1942		
3B	Admin/Medical Clinic	28,449	73	1942		
4	Admin/Operations Center/Auditorium/ Exchange Retail	90,492	73	1942		
5	Admin/Operations	17,899	73	1942		
5a	Admin	7,012	73	1942		
56	Recycle Shed	1,280	49	1966		
(b) (7)	(F), (b) (3) (A)					
601	PMO/Pass and ID	3,758	28	1987		
(b) (7)(F), (b) (3) (A)						
20e	Admin	2,361	25	1990		
125	Training Pool	n/a	71	1944		
610	Pool/Picnic Pavilion	440	11	2004		
401	UPH	10,899	46	1969		
402	UPH	10,899	46	1969		
403	UPH	10,899	46	1969		
404	UPH/Admin	13,978	46	1969		

Camp Smith Area Development Plan

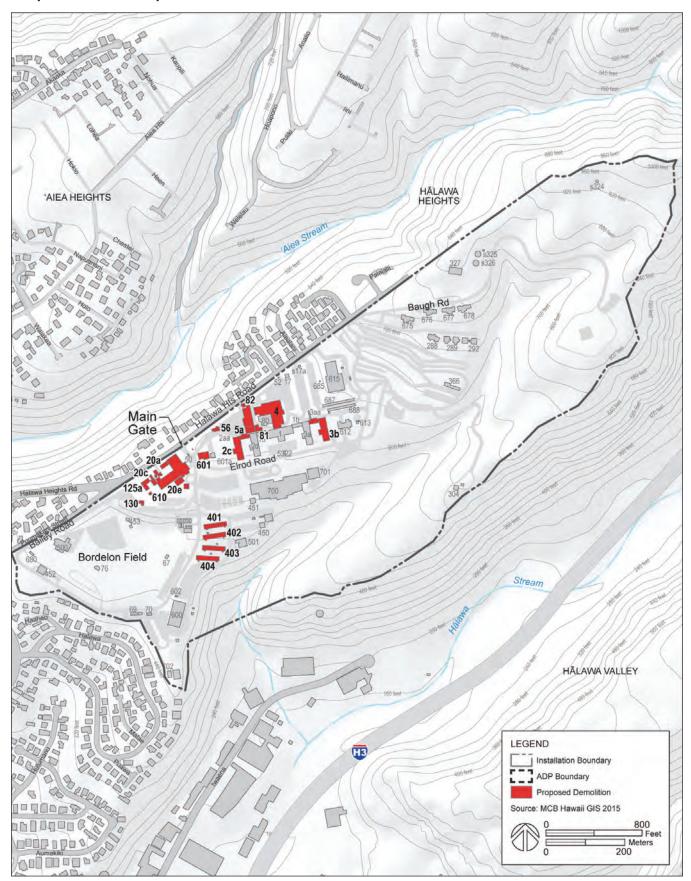


Figure 7-2 Camp Smith Demolition Plan



Photo by Jay Parco. www.dvidshub.net

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Acronyms and Abbreviations

III MEF	III Marine Expeditionary Force	JBPHH	Joint Base Pearl Harbor-Hickam
AC	Acre	KD	Known Distance
ADP	Area Development Plan	KG	Thousand Gallons per Day
ASP	Ammunition Supply Point	kV	Kilovolt
AT/FP	Antiterrorism/Force Protection	kVA	Kilovolt Ampere
BEQ	Bachelor Enlisted Quarters	LF	Linear Feet
BFR	Basic Facility Requirement	LOGCOM	Marine Corps Logistics Command
BN	Battalion	MAG	Marine Aircraft Group
CCN	Category Code Number	MAGTF	Marine Air Ground Task Force
CCTV	Closed-circuit Television	MARFORPAC	U.S. Marine Corps Forces Pacific
CDET	College of Distance Education and	MCAS	Marine Corps Air Station
	Training	MCB Hawaii	Marine Corps Base Hawaii
CIP	Capital Improvement Plan	MCCS	Marine Corps Community Services
CISD	Communications Information Systems Directorate	MCO	Marine Corps Order
CLB	Combat Logistics Battalion	MCTAB	Marine Corps Training Area Bellows
CPRW	Commander, Patrol and	NAVFAC	Naval Facilities Engineering Command
CHW	Reconnaissance Wing	PAC	Pacific
DNL	Day–Night Average Sound Level	PCA	Pearl City Annex
EA	Each	PMO	Provost Marshal's Office
EA	Environmental Assessment	PN	Personnel
FP	Firing Point	RTF	Range Training Facility
FT	Feet	ROM	Rough Order of Magnitude
FY	Fiscal Year	SAIA	Sikes Act Improvements Amendments
GIS	Geographic Information System	SDZ	Surface Danger Zone
HSM	Helicopter Maritime Strike Squadron	SF	Square Feet
HI	Hawaii	SOCPAC	Special Operations Command Pacific
ICRMP	Integrated Cultural Resources	SOI	School of Infantry
	Management Plan	SY	Square Yard
IMP	Installation Master Plan	TECOM	Marine Corps Training and Education
INRMP	Integrated Natural Resources		Command
	Management Plan	TSF	Training Support Facility

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Marine Corps Base Hawaii Installation Master Plan **Puuloa Range Training Facility Area Development Plan**

UFC Unified Facilities Criteria

UM Unit of Measure

USPACOM U.S. Pacific Command

VR Navy Reserve Squadron

WWBN Wounded Warrior Battalio

WWII World War II

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FOR OFFICIAL USE ONLY Introduction

Puuloa Range Training Facility Area Development Plan



2 Introduction FOR OFFICIAL USE ONLY

1 Vision, Goals, and Objectives

1.1 Background

Puuloa RTF is a 137-ac U.S. Marine Corps-owned and operated small arms live-fire training range facility located just west of the channel entrance to Pearl Harbor on the 'Ewa Plain of O'ahu's south coast, as shown on Figure 1-1. The facility has six live-fire ranges used for small arms marksmanship training, qualification, and requalification. The ranges are also periodically used by the Navy; the Army; federal, state, and local law enforcement; and local gun clubs (U.S. Marine Corps 2014).

Puuloa RTF shares the Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.2 Puuloa Range Training Facility

Puuloa RTF has its own vision, goals, and objectives that take into consideration the installation's unique mission, functions, location, and physical conditions.

1.2.1 Goals and Objectives

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable. The primary planning goal for Puuloa RTF is to ensure that facilities and infrastructure are improved and maintained to ensure continuing safe and secure operation of the ranges.

The specific planning objectives of the *Puuloa RTF ADP* include the following.

- · Improve the front and back gates and guardhouses
- Upgrade the communication infrastructure
- Relocate overhead electrical and communication lines to underground conduits
- Site 9,900-sf range operations and support building
- · Site new transient bachelor enlisted quarters (BEQ) and parking lot
- · Pave the main service roads
- Plant vegetation to screen the installation from the adjacent neighborhood

District Mission

To provide live small arms training and annual requalification training to all tenant units of MCB Hawaii, sister services, and federal and state organizations, and sniper training for designated units

District Vision

To provide a state-of-the-art pistol and rifle range with flexible and modern training capabilities for the Marine Corps, sister services, and federal and state organizations on Oʻahu

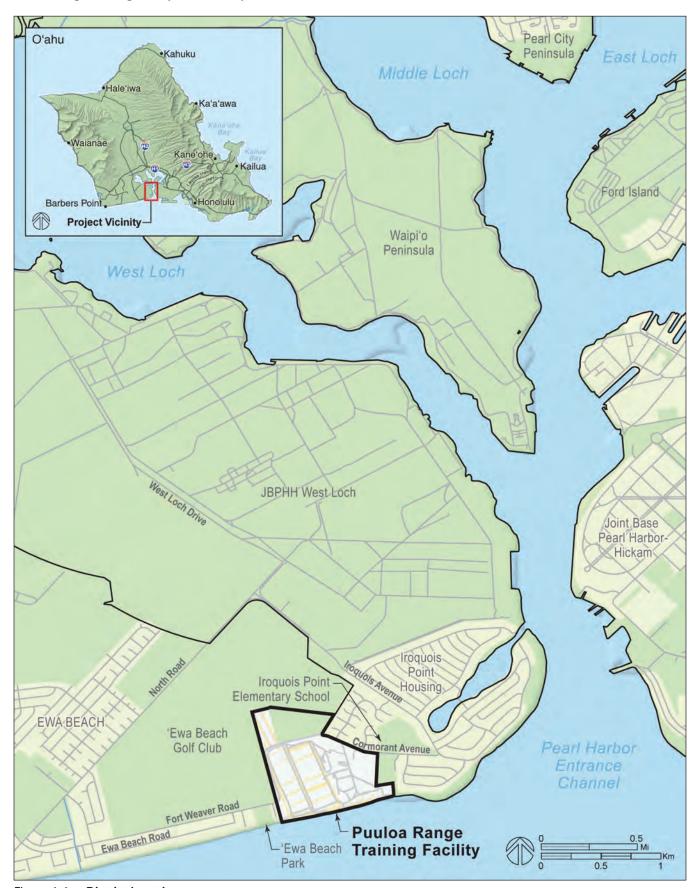


Figure 1-1 **District Location**

2 Facility Requirements and Land

This section of the plan establishes the major personnel and equipment loading and basic facility requirements (BFR) upon which the *Puuloa RTF ADP* is based.

2.1 Area Force Loading

Approximately 30 permanent party personnel are assigned to Puuloa RTF. Transient quarters and the dining facility can support up to a company-sized unit during multi-day training exercises and classes.

2.2 Area Equipment Loading

There is no major equipment (rolling stock) located within this district.

2.3 Facility Requirements

Basic facility requirements for the Puuloa RTF were updated by a Naval Facilities Engineering Command Pacific (NAVFAC PAC) asset evaluation in 2013. A summary of the major facility requirements, existing assets, and facility surpluses and deficiencies at Puuloa RTF are presented in Table 2-1.

Table 2-1 Puuloa RTF Facility Requirements (CCN 14345–CCN 72124)

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
14345	14345				
14378	(D) (7)(F	1)			
17110	Academic Instructions Building	SF	0	1,873	1,873
17135	Operation Trainer Facility	SF	1,609	1,213	(396)
17310	Range Operations Building	SF	12,600	4,599	(8,001)
17311	Range Support Building	SF	2,400	500	(1,900)
17330	Covered Training Area	SF	2,485	2,485	0
17431	Impact Area Non-Dudded	AC	0	20	20
17550	Rifle Known Distance (KD) Range	FP	40	40	0
17903	Hand To Hand Combat Pit	EA	1	0	(1)
17940	Small Arms Range—Outdoor	EA	5	5	0
17950	Training Course	EA	1	1	0
42135	(h) (7)(F)				
42148					
44112	Storage of Air or Ground Organic Units For Marine Corps	SF	0	3,499	3,499
69010	Flagpole Billboard Marker	EA	0	1	1
72124	Bachelor Enlisted Quarters—Marines E1/E4	PN	40	40	0

Table 2-1 **Puuloa RTF Facility Requirements** (CCN 72151–CCN 87220)

Table 2-1 Pulloa KTF Facility Requirements (CCN 72131–CCN 87220)					
CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
72151	Transient Personal Unit Barracks E1/E4	PN	148	148	0
72210	Enlisted Dining Facility	PN	123	40	(83)
73025	(b) (7)(F)				
73066	Miscellaneous Personnel Weather Shelters	SF	1,000	106	(894)
74044	Indoor Physical Fitness Center (Gym)	SF	8,762	3,100	(5,662)
74078	Recreation Pavilion	SF	1,536	1,536	0
75010	Outdoor Playing Courts	EA	1	1	0
81220	Street Lighting	LF	0	1,000	1,000
81231	(1-) (2) $(A$	1	(12)	(7	
81232	(0)(3)(A),(0))(F)
84210	(b) (7)(F)				
84420					
85110	Roads	SY	0	1,775	1,775
85111	Roads, Unsurfaced	SY	0	35,623	35,623
85210	Parking Area	SY	0	9,562	9,562
85220	Sidewalk	SY	0	1,015	1,015
85235	Other Paved Areas Not Coded in the 100 or 400 Series	SY	0	347	347
87130	Irrigation Facility	LF	0	11,978	11,978
87210	(b) (7)(F)				
87215	Interior Fencing (Not Coded in 872-10)	LF	0	4,803	4,803
87220	(b) $(7)(F)$				

2.4 Developable Real Estate

During the planning process, areas throughout the 137-ac Puuloa RTF were assessed for their ability to accommodate future development or redevelopment, and were classified into four categories.

- **Developable:** Minimal natural and cultural constraints and free of buildings, roads, or parking
- **Potentially Developable:** Some existing horizontal infrastructure such as roads, parking, or playing fields
- Developable with Constraints: Relocatable facilities, infrastructure, or tenant functions; other manmade and/or natural/cultural resource constraints
- **Not Developable:** Mission-critical, newly constructed, or not relocatable facilities or infrastructure; natural, cultural, or environmental constraints

Approximately 40-ac of dense vegetation (primarily kiawe trees) are identified as being Developable, although the area also currently serves as a natural buffer between operations and the adjacent neighborhood. Areas identified as Developable with Constraints include those inside the surface danger zones (SDZ) or areas with existing buildings. The availability of areas at Puuloa RTF for future development is shown on Figure 2-1.

Developable

 Minimal natural and cultural constraints and free of buildings, roads, or parking

Potentially Developable

 Some existing horizontal infrastructure, such as roads, parking, or playing fields

Developable with Constraints

- Relocatable facilities, infrastructure or tenant functions
- Other manmade and/or natural/cultural resources constraints

Not Developable

- Mission-critical, newly constructed or not relocatable facilities or infrastructure
- Natural, cultural, or environmental constraints

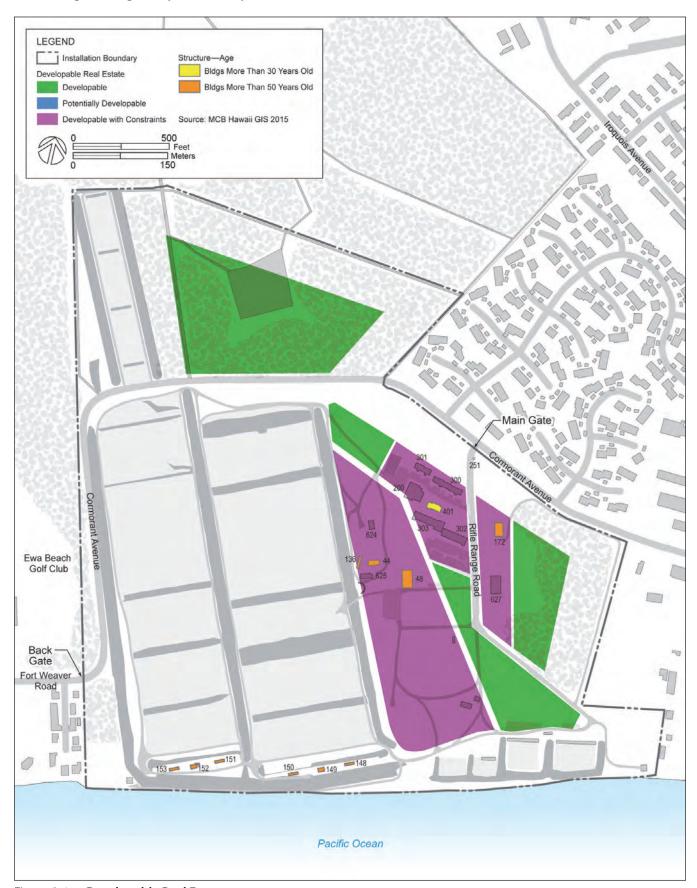


Figure 2-1 Developable Real Estate

2.5 District Assets

The majority of the land area in the district is occupied by six training ranges—two rifle ranges, two pistol ranges, and two multipurpose/close combat ranges. The two rifle ranges, Range A and Range B, have a total of 103 firing points and occupy the entire western half of the installation. Range A was recently lengthened to 1,000 yards to host the Scout Sniper Basic Course. The rifle ranges are surrounded by berms standing approximately 20-ft high. To the east of the rifle ranges, pistol ranges C through F are located side by side along the coast. Two guard houses are located at the coast to secure the range during exercises.

The second largest land use is for range support, including administrative, maintenance, and personnel support functions. These uses, in the central portion of the district, include range control (Building 401), range operations and maintenance (Building 172), an outdoor classroom (Building 627), two BEQ (Buildings 300 and 301), two transient barracks (Building 302 and 303), a fitness center/mess hall (Building 200), and an outdoor basketball court. (b) (7)(F)

(b) (7)(F)

(b) (7)(F) . A small portion (3.7 ac) of the district is used for beach recreation when not in conflict with the operation of the nearby pistol range.

These facilities and other landmarks are illustrated on the Puuloa RTF Base Map (Figure 4-2) in Section 4.0, Base Maps.

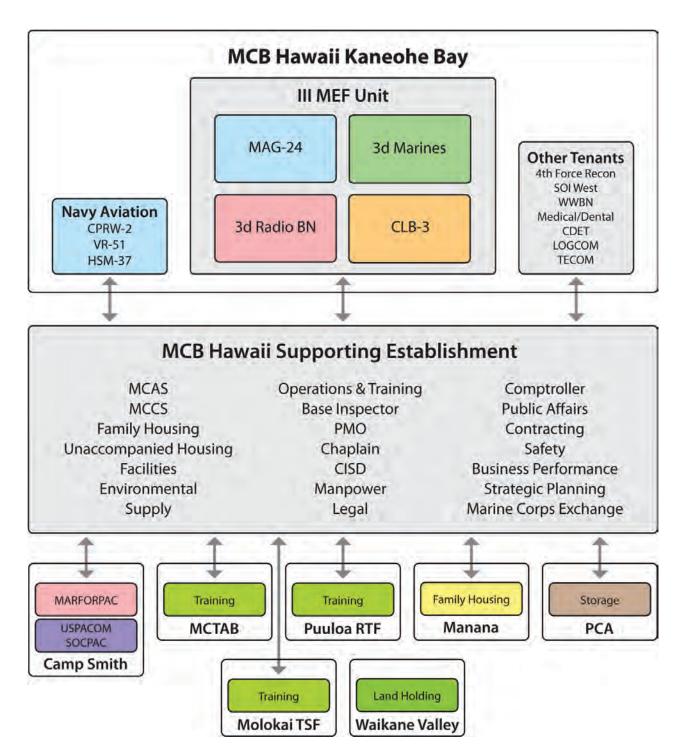


Figure 3-1 MCB Hawaii Functional Relationships

3 Functional Relationships

3.1 Marine Corps Base Hawaii

Figure 3-1 illustrates the relationships between major functions at MCB Hawaii locations. As the supporting establishment, MCB Hawaii provides facilities and services in direct support of tenant units, individuals, and their families. Puuloa RTF is one of two MCB Hawaii live-fire training ranges on Oʻahu used by all units for weapons instruction, qualification, and regualification.

Marine Corps tenant commands can be viewed through the organizational structure of a Marine Air Ground Task Force (MAGTF). A MAGTF is organized according to its mission. The Marine Corps units on O'ahu are, at times, assigned to designated MAGTFs for training, contingencies (alert), or operational deployments. In garrison, however, while units conceptually retain their elemental categorization for the purpose of understanding their relationships and activities for a functional analysis, they do not collectively fall under a formal, standing, or dedicated Hawaii MAGTF.

The Aviation Combat Element component of the MAGTF construct on O'ahu is Marine Aircraft Group 24 (MAG-24). The 3d Marine Regiment is the Ground Combat Element component, and Combat Logistics Battalion 3 (CLB-3) represents the Logistics Combat Element component. All of these units are operationally subordinate to III Marine Expeditionary Force (III MEF) commands on Okinawa, Japan. There is no standing Command Element on O'ahu; however, certain internal Command Element functions/units do reside at various locations.

3.2 Puuloa Range Training Facility

Figure 3-2 illustrates the relationships between major land uses at Puuloa RTF. In addition to the six training ranges, other supporting uses included range operations, maintenance, and instruction areas. Housing and personnel support functions form a separate living zone in a location within convenient walking distance of the work and training areas. BEQs and recreation facilities are located outside of the area encumbered by SDZ.

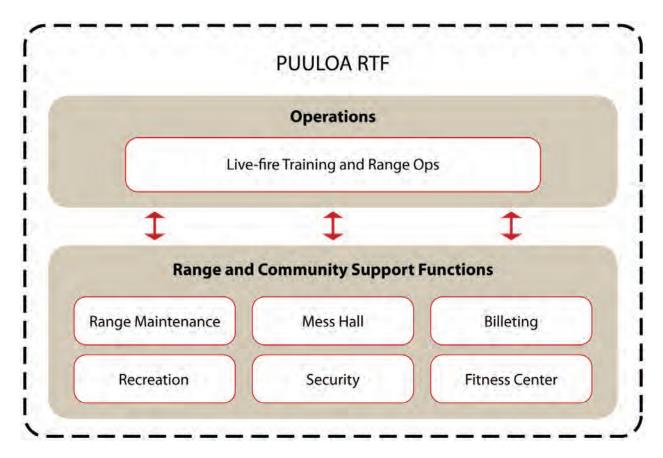


Figure 3-2 **Puuloa RTF Functional Relationships**

4 Base Map

Figure 1-1 in Section 1 shows Puuloa RTF in relation to Joint Base Pearl Harbor–Hickam and the surrounding 'Ewa Beach community. Figure 4-1 highlights the major facilities and the physical geography of the installation.

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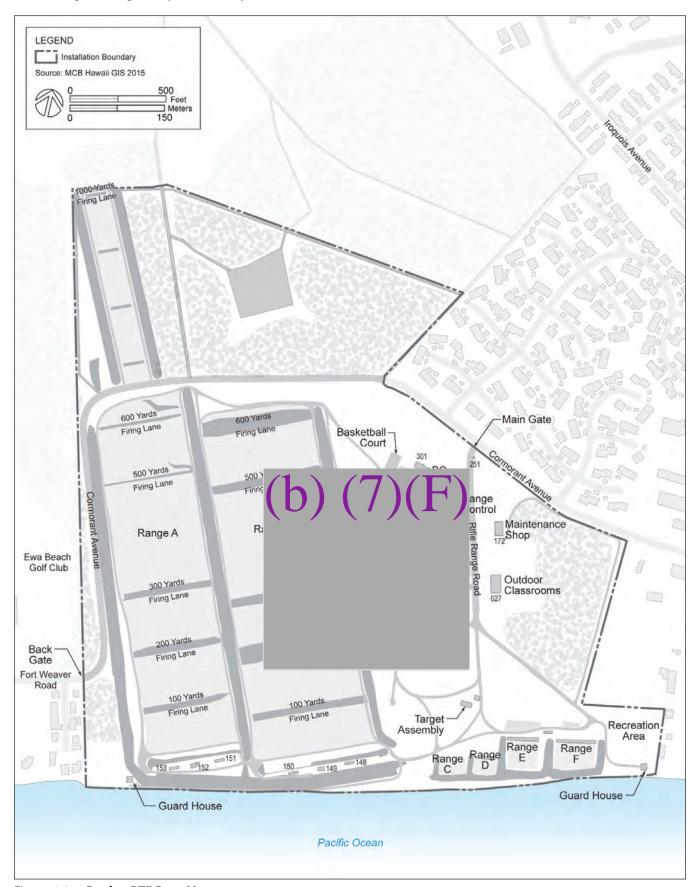


Figure 4-1 **Puuloa RTF Base Map**

14 Section 4 | Base Maps FOR OFFICIAL USE ONLY

5 Data Collection

Stakeholder interviews, site visits, workshops, existing plans and studies, BFRs, and geographic information system (GIS) and facility databases were all primary information sources contributing to the development of the *Puuloa RTF ADP*.

5.1 Stakeholder Participation

Interviews and site visits were conducted with the stakeholders to ensure the ADP presents a development plan in support of the current and future operations and mission requirements of the installation. Stakeholders also participated in a four-day charrette followed by a series of concept workshops to refine the recommended planning actions. A report of each workshop is documented in IMP Appendices A and B, respectively.

5.2 Existing Reports and Studies

The ADP also incorporates information, analyses, and recommendations from previous MCB Hawaii reports and studies. An annotated bibliography of resources informing the development of the ADP is presented as follows.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The Integrated Cultural Resources Management Plan (ICRMP) is a multi-year plan that supports the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management. It is a planning and decision document for cultural resources management and specific compliance procedures. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Commanding General, Marine Corps Forces Pacific; Commanding Officer, Marine Corps Base Hawaii; and Naval Facilities Engineering Command. United States Marine Corps Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study. March 2014.

The study identifies Marine Corps training requirements, identifies gaps in capabilities, and develops recommendations for possible future training sites to sustain MAGTF training in the Hawaiian Islands.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

This is an update of the original 2001 MCB Hawaii INRMP/EA and the first update (2006). It is intended to guide implementation or MCB Hawaii integrated natural resources management program, which was established in compliance with the Sikes Act Improvements Amendments (SAIA) of 1997. The SAIA requires all military installations with significant natural resources to prepare, implement, and regularly review plans to manage their natural resources.

Puuloa RTF stakeholders included representatives from the following units and departments.

MCB Hawaii Leadership and Administration

Operations & Training
Department

Facilities Department

Public Works Department

Communications Information Systems Directorate

Environmental Department

Naval Facilities Engineering Command Pacific

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Section 5 | Data Collection

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land use Plan, Final. December 2006.

This master plan was prepared in 2006 to provide land use and facility development guidelines for MCB Hawaii. Although many of its planning recommendations have been revisited with the current IMP and ADP effort, this document provided baseline information on environmental conditions that remains relevant.

16 Section 5 | Data Collection FOR OFFICIAL USE ONLY

6 ADP Area Analysis

Section 6 presents the regional and onsite conditions related to Puuloa RTF. Section 6.1, Regional Context, describes the neighboring civilian community. Section 6.2, Onsite Conditions, describes the existing conditions and manmade, natural, and cultural resource constraints at Puuloa RTF. A recommended ADP is presented graphically on Illustrative, Circulation, and Regulating Plans.

6.1 Regional Context

The Puuloa RTF is located on the eastern edge of the 'Ewa Plain in leeward O'ahu, west of Iroquois Point and the Pearl Harbor entrance channel. Puuloa RTF is within the town of 'Ewa Beach, an urbanized area located approximately 25 miles west of downtown Honolulu. According to the 2010 U.S. census, 'Ewa Beach had a population of 14,955.

Lands to the north and east of Puuloa RTF are owned by the Navy and include the privatized Iroquois Point Housing area. To the east of the housing area, the Iroquois Point Elementary School is located on lands owned by the City and County of Honolulu. The western border of the district adjoins private property, portions of which have been developed into single-family housing and a private golf course. Directly adjacent to the western edge of this residential area (approximately 300 ft from Puuloa RTF) is 'Ewa Beach Park, a public recreation area. The southern boundary of the installation fronts the Pacific Ocean.

See Section 1, Figure 1-1, District Location, for a map showing Puuloa RTF in the context of 'Ewa, O'ahu.

6.2 Onsite Conditions

This section describes the general physical characteristics of the surrounding 'Ewa Plain area.

6.2.1 Geology

The 'Ewa Plain is a relatively flat coastal plain. The northeastern edge of the plain, where Pearl Harbor is located, is the low area across which nearly horizontal late flows of the Koʻolau volcano banked against the dormant or newly-extinct Waiʻanae volcano. Pearl Harbor, the main geological feature of this area, is a drowned river valley. The south part of the plain, where Puuloa RTF is located, is the limestone of an emerged reef that formed during a period of high sea stands (Department of the Navy 2006). The plain is also notable for countless sinkholes caused by chemical weathering (dissolution) of the limestone shelf.

6.2.2 Topography

The land at Puuloa RTF is relatively level, with natural elevations ranging from 0 ft to 10 ft above mean sea level. The ranges are enclosed by 10–20 ft high earthen safety berms, with an approximately 3:1 slope.

6.2.3 Hydrology

A shallow limestone aquifer underlies much of the *makai* (coastal) portion of the 'Ewa Plain. There are no water bodies or wetland areas at Puuloa RTF.

6.2.4 Soils

Puuloa RTF is situated on an exposed coral reef outcrop, originally formed in shallow ocean water during a period of high sea level. Soils in the district consist of coral or cemented calcareous sand, with 10–20 percent of a thin layer of friable red soil material in crevices and depressions in the coral (Marine Corps Base Hawaii 2011).

6.2.5 Climate

The climate of Hawai'i is mild maritime/tropical with relatively stable year-round temperatures. The Hawaiian Islands experience two seasons: summer (May to October) and winter (November to April). Summer is characterized by overhead sun, heat, and mild tradewinds, while winter has higher rainfall, cooler temperatures, and stronger tradewinds. The predominant wind direction in the Hawaiian Island is from the east-northeast at 10 knots.

In the 'Ewa area of O'ahu where Puuloa RTF is located, average annual rainfall is approximately 20 in. Monthly average low and high temperatures at Puuloa RTF range from 71 to 89 degrees Fahrenheit in the warmest month (August) and from 62 to 81 degrees Fahrenheit during the coolest month (February) (Department of the Navy 2006).

6.2.6 Vegetation

Natural vegetation at Puuloa RTF, and the 'Ewa area in general, is sparse as a result of the low annual rainfall and poor soil conditions. The underlying coral outcrop does not hold water well.

Unmanaged lands in the district have a vegetation cover that consists of *kiawe* (*Prosopis palida*), *haole koa* (*Leucaena leucocephala*) and fingergrass (*Chloris spp.*). The interior, developed portion of the district has landscape plantings and trees that include coconut (*Cocos nucifera*), ironwood (*Casuarina equisetifolia*), Norfolk pines (*Araucaria heterophylla*), banyan (*Ficus spp.*), and monkeypod (*Samanea saman*). Only beach areas include a few scattered native species. No federal- or state-listed, proposed, or candidate threatened or endangered species of plants exist at Puuloa RTF (Department of the Navy 2006 and Marine Corps Base Hawaii 2011).

6.2.7 Wildlife Habitat

The endemic Hawaiian short-eared owl (pueo) is known to occasionally inhabit Puuloa RTF and surrounding areas. The owl is rare on O'ahu and has been listed as endangered on the island by the State of Hawai'i. The owl may occasionally use the open areas of the installation for hunting and loafing. There are no

other known federal- or state-listed, proposed, or candidate threatened or endangered species of wildlife associated with the Puuloa District.

The green sea turtle or *honu* (*Chelonia mydas*), a federal-listed threatened species, has also been observed in the waters off of the district.

6.2.8 Land Use

Figure 6-1 shows existing land use at Puuloa RTF. A description of land use is provided in Section 2.5, District Assets.

6.2.9 Transportation Network

The main gate into Puuloa RTF is located on Cormorant Avenue. Once inside the entry gate, Rifle Range Road provides paved access to the main facilities and parking areas, as shown on Figure 6-2. The ranges are accessed via unpaved dirt and coral roads, which are susceptible to ponding in heavy rains. Six hundred feet west of the main gate on Cormorant Avenue, the installation fence line intersects the road. Cormorant Avenue continues for 0.6 mi inside the fence line around the ranges to a back gate at Fort Weaver Road. A dirt road continues south past the back gate to the western shoreline guardhouse and beach. Range support personnel primarily drive golf carts or light-weight utility vehicles; traffic within the district is minimal.

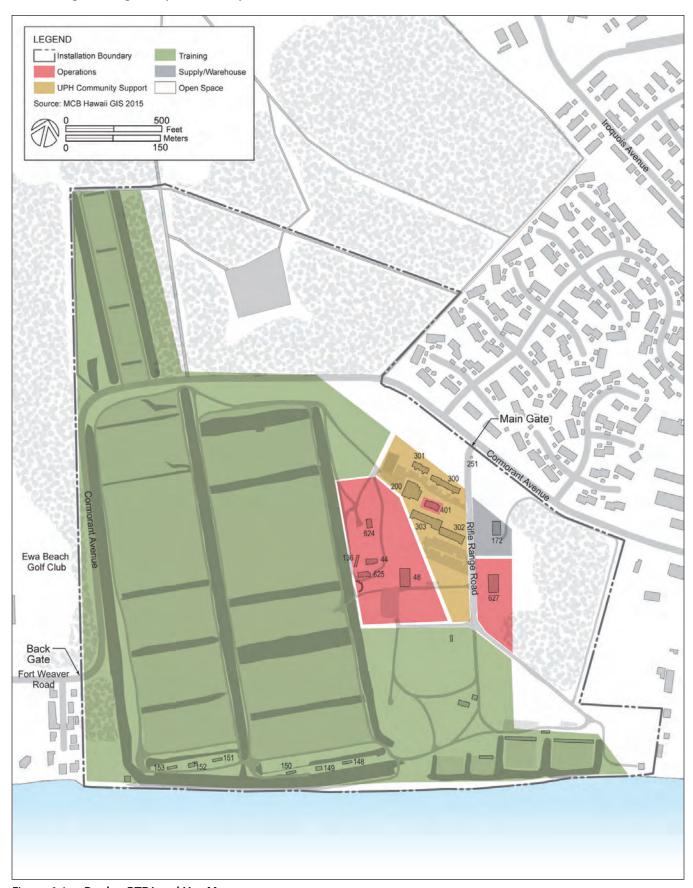


Figure 6-1 Puuloa RTF Land Use Map

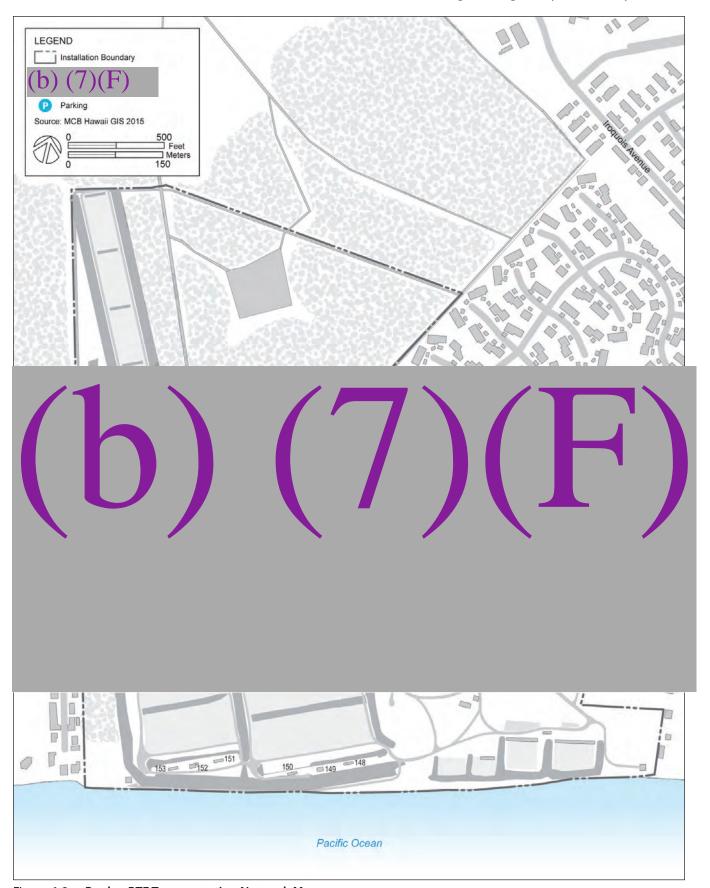


Figure 6-2 **Puuloa RTF Transportation Network Map**

6.2.10 Utilities

This section provides an overview of the water, electrical, wastewater, storm drainage, and communication systems at Puuloa RTF.

Water

The water distribution system at Puuloa RTF is shown on Figure 6-3 and is part of the Pearl Harbor Complex system that is owned and maintained by NAVFAC HI. The system has three sources of water, including the primary source at

(b) (7)(F)

Wastewater

The wastewater system is shown on Figure 6-4 and is owned and maintained by NAVFAC HI. It consists of a series of gravity lines and force mains that convey domestic sewage to the City and County of Honolulu's 'Ewa interceptor sewer system, which, in turn, conveys the flows to the Hono'uli'uli Wastewater Treatment Plant located near Barbers Point. The treated effluent is discharged through the Barbers Point Ocean Outfall and regulated by a State of Hawai'i Department of Health National Pollutant Discharge Elimination System permit.

Electrical

The electrical system is shown on Figure 6-5 and is owned and maintained by NAVFAC HI. The 12 kV incoming line from Hawaiian Electric Company is stepped (b) (3) (A), (b) (7)(F)

boundary. The present system has adequate capacity to meet existing demand; however, further development at Puuloa RTF may require a utility assessment to evaluate the capacity and quality of electrical power.

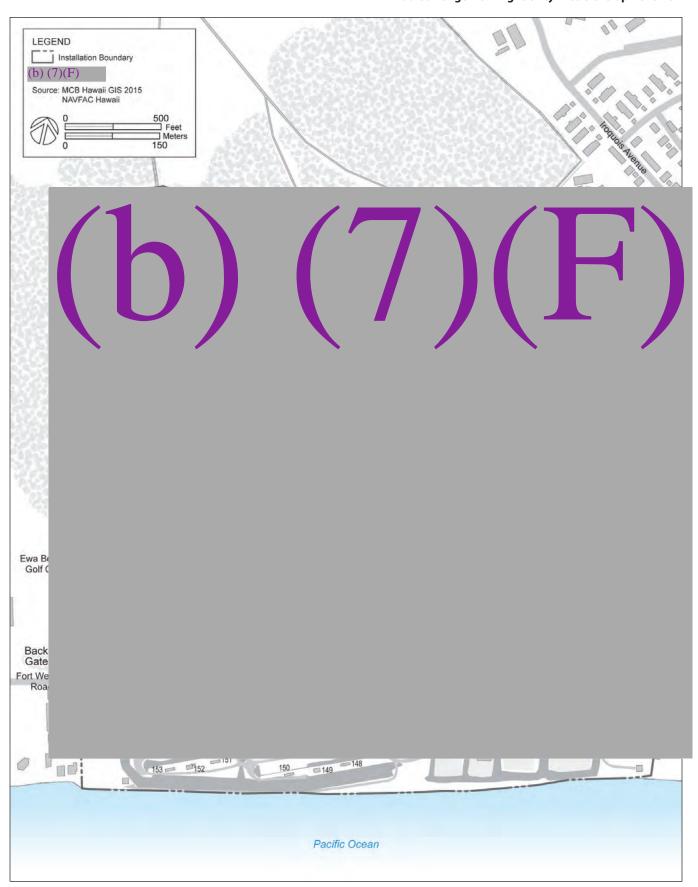


Figure 6-3 **Puuloa RTF Water System**



Figure 6-4 **Puuloa RTF Wastewater System**

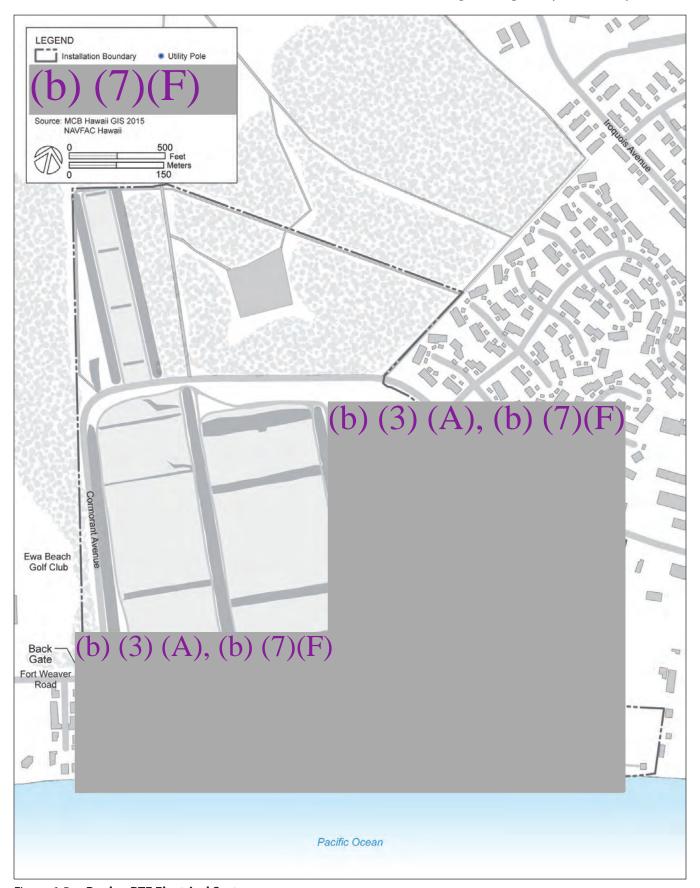


Figure 6-5 **Puuloa RTF Electrical System**

6.2.11 Environmental Conditions and Hazards

Figure 6-6 shows a portion of Puuloa RTF located within the Federal Emergency Management Agency flood hazard Zone A, an area that lies within the 100-year flood plain, but where base flood elevations have not been determined.

6.2.12 Archaeological and Historic Architectural Resources Site History and Context

Puuloa RTF lies along the central coast of the traditional land area or *'ili* of Pu'uloa in the *ahupua'a* of Hono'uli'uli, the largest and westernmost *ahupua'a* in the traditional district of 'Ewa. Although dry and virtually waterless, the 'Ewa Plain was occupied and used in pre-Contact times. The ICRMP notes that it was probably visited by early Hawaiians on fishing or bird hunting expeditions as early as AD 200 to 600. Permanent occupation of the plain is dated to the AD 1400s to 1500s. Most of the 'Ewa plain was modified for dryland agriculture, using sinkholes and stone mounds as the primary cultivation media. Utilitarian plants included coconut palm (*Cocos nucifera*), *milo* (*Thespesia populnea*), *noni* (*Morinda citrifolia*), banana (*Musa sp.*), ti (*Cordyline fruticosa*), and sugarcane (*Saccharum officinarum*).

Pu'uloa's coastal location is in close proximity to Keahi Point, which was known as a location where the valued resources of *līpoa* (seaweed) and 'ō'io (fish) could be collected. This suggests that the area would have been a likely location for fishing camps, as well as possible late pre-Contact permanent settlement. Coastal sections of Pu'uloa near the entrance to Pearl Harbor were also utilized for salt production from at least the mid-19th century (Department of the Navy 2014).

In the post-Contact era, the surrounding 'Ewa area was utilized for ranching operations from the 1880s through the 1950s. The Pu'uloa site was acquired by the Army as part of the Coastal Defense System through negotiated purchases between 1904 and 1921 and was later transferred to the Navy. The Navy developed the area into a small-arms range, and by 1927, the Puuloa Naval Reservation became known as the Navy Rifle Range. The Marine Corps maintained the range for rifle and pistol practice. By 1934, it was known as the Marine Corps Rifle Range. During the Vietnam era, Marine training intensified, and a sniper school was established at the Puuloa Training Facility. In July 1970, the facility was transferred from Marine Barracks Hawaii (formerly Marine Barracks Pearl Harbor) to Camp Smith.¹ Puuloa RTF recently expanded with the addition of former Federal Aviation Administration lands to the north.

Archaeological Resources

Most of the land within the Puuloa RTF has been disturbed, and as a result, any archaeological sites that may have existed have been destroyed. According to the ICRMP, a 1984 archaeological survey identified three areas that potentially contain archaeological resources at the installation. These areas, shown on Figure 6-6, include an area of unfilled limestone sinkholes; an area along the

¹ http://www.mcbhawaii.marines.mil/.

beach with several abandoned military facilities, including three concrete bunkers that many have been associated with World War II coastal defense; and the coastal portion of the recreational area containing evidence of a Native Hawaiian cultural deposit. The ICRMP classifies the sinkholes and the abandoned bunkers as zones of low archaeological sensitivity. The coastal portion of the recreation area is categorized as a high-sensitivity zone as the archaeological deposit found in this sandy area could contain habitation features, burials, and/or activity debris.

Historic Architectural Resources

Historic buildings and structures at Puuloa RTF have yet to be evaluated for eligibility to be listed in the National Register of Historic Places, although the three World War II-era bunkers and numerous other structures meet the 50-year age criteria for eligibility (Department of the Navy 2014).

6.2.13 Safety Hazards



Surface Danger Zone

Weapon firing is conducted toward the ocean to minimize the amount of land encumbered by SDZ during range activity. Most of the SDZ extend offshore and within the Pearl Harbor Naval Defense Sea Area. By federal law, the general public is not allowed entry into this area without specific permission. Additional range safety measures include the following.

- · Enclosing the ranges with earthen berms
- Establishing an area-wide Notice to Airmen to notify all pilots of the hours and dangers associated with active ranges
- · Hoisting red warning flags prior to firing
- Clearing the SDZ of all personnel prior to firing
- Manning the guardhouses at the shoreline to monitor and prevent beachgoers and small craft from entering the SDZ (a cease fire is called whenever an incursion is made).
- Restricting firing to between 0700 and 1700
- · Limiting usage of Range A to reduce noise impacts and the SDZ

Ammunition Storage



6.2.14 AT/FP Physical Security

Puuloa RTF is surrounded on three sides by civilian land uses, and to the south by the Pacific Ocean and the Pearl Harbor Naval Defensive Sea Area. Physical



Within the boundary of the installation, antiterrorism/force protection (AT/FP) guidelines dictate separation distances between roadways, vehicle parking, and buildings. For master planning purposes, applicable standoff distances are listed in *UFC 2-100-01*, *Installation Master Planning* (May 2012). Figure 6-7 shows lands at Puuloa RTF encumbered by the standoff distances for reinforced concrete construction, which is the construction type requiring the least separation from vehicles and installation boundaries.

6.2.15 Noise Pollution

The primary sources of noise at Puuloa RTF are from aircraft using Honolulu International Airport and from small arms training on the ranges. Day–night average sound level (DNL) is the FAA's standard metric for determining exposure to noise. Noise analysis conducted for the *Honolulu International Airport Master Plan* (2010) shows Puuloa RTF outside of the 60 DNL contour, indicating existing aircraft noise levels are compatible with land uses at the training facility. In addition to aircraft passing overhead, small arms fire is a significant source of noise in the region. Noise from the firing ranges is mitigated by earthen berms and landscaping along the sides of Ranges A and B and by restricting usage to only certain hours during the day (Department of the Navy 2006).

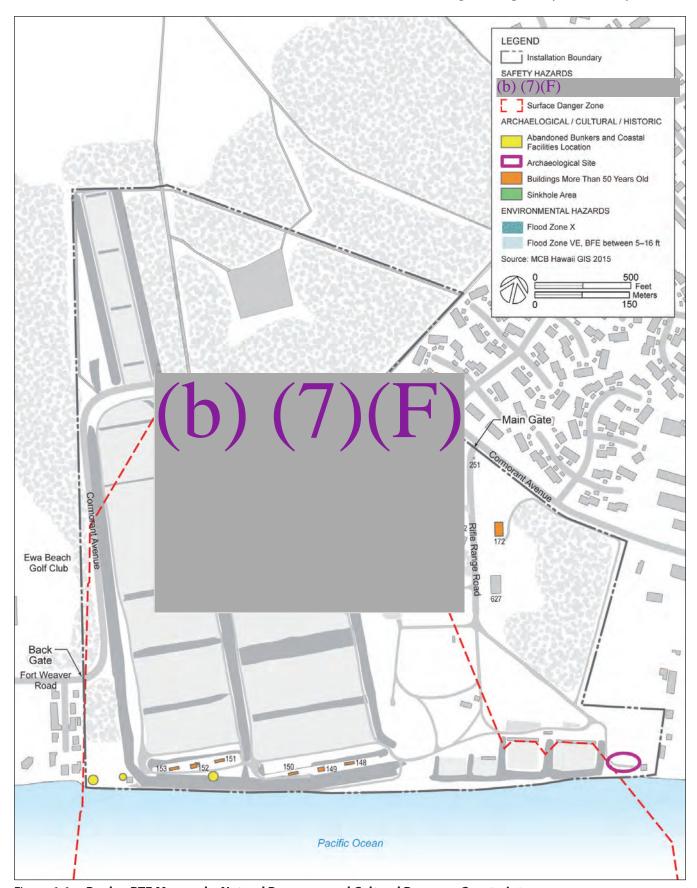


Figure 6-6 **Puuloa RTF Manmade, Natural Resource, and Cultural Resource Constraints**

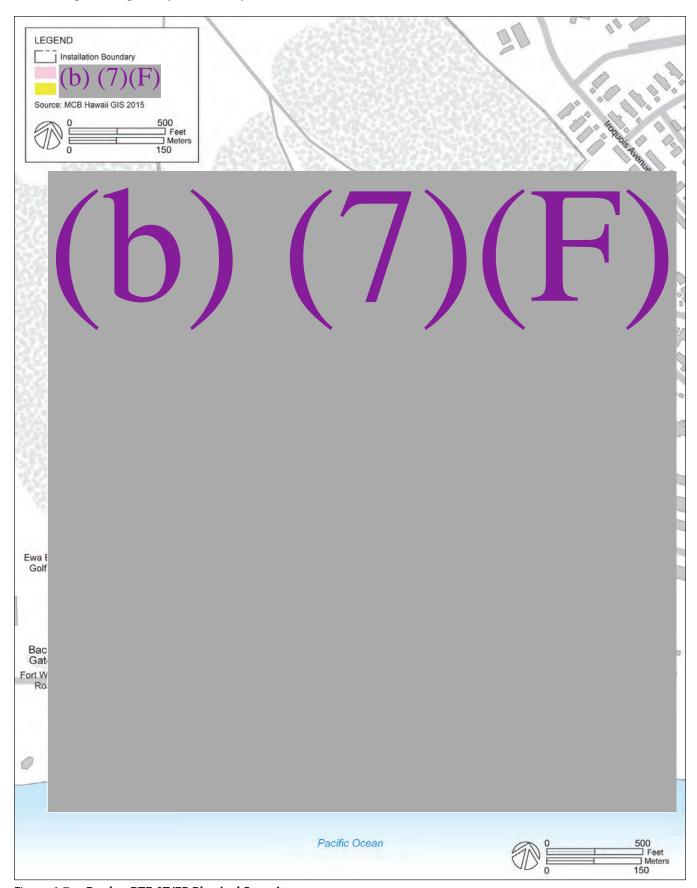


Figure 6-7 Puuloa RTF AT/FP Physical Security

6.3 Alternative Site Development And Evaluation

The primary planning goal for Puuloa RTF is to ensure that facilities and infrastructure are improved and maintained to ensure continuing safe and secure operation of the ranges. As such, future development is limited in scope and did not require the development of alternative planning actions for evaluation as only a few projects are proposed for the installation.

6.4 Area Development Plan

This section presents the ADP for Puuloa RTF, which supports the overall MCB Hawaii planning vision and goals while providing more detailed plans to achieve specific installation-level goals and objectives. Future improvements envisioned at Puuloa RTF are reflected graphically through an Illustrative Plan, a Regulating Plan, and a Circulation and Parking Plan.

6.4.1 Illustrative Plan

The Illustrative Plan (Figure 6-8) graphically portrays planned and recommended future development projects and are described in detail as follows.

Range Operations and Support Facility

Construct a 9,900-sf range operations and support facility to address a shortfall of space identified by the 2013 asset evaluation and to relocate older support facilities outside of the SDZ. A 20-stall surface parking lot is planned to the north.

Physical Security Improvements



Bachelor Enlisted Quarters

Existing bachelor enlisted quarters are well-sited and should be replaced on the existing locations as required in the future. If the unaccompanied housing requirement grows in the future, the plan shows a preferred location for additional development, and includes a 20-stall surface lot east of Rifle Range Road.

Roadway and Parking Improvements

Pave the dirt access road from the parking lot south of the b (7)(F) to the portion of Cormorant Avenue inside the installation fence line. This frequently used pathway provides access to the two Ranges A and B. A 12-ft wide paved alignment is sufficient for the type and volume of vehicles. An additional 20-stall surface parking lot is planned for the field north of the BEQ.



Figure 6-8 **Puuloa RTF Illustrative Plan**

6.4.2 Regulating Plan

The Regulating Plan, shown on Figure 6-9, provides information on the type, form, and scale of buildings. It includes guidance on required build-to lines, required entry locations, and acceptable uses and building types. It also prescribes maximum building heights (floors) to regulate development density and limit visual impact on the surrounding community.

The Regulating Plan for Puuloa RTF continues the existing and training and support uses. Building types prescribed by the Regulating Plan are defined in *UFC 2-100-01, Installation Master Planning* (May 2012) and include the following.

- Mission Building Types (airfield, flight line facilities, hangars, and armories)
- Industrial Building Types (warehouses, maintenance facilities/shops, and motor pools)
- · Administrative Building Types (headquarters facilities and general offices)
- Educational and Training Building Type (classrooms and trainers)
- Medical Building Types (medical centers and clinics)
- Commercial Community Support Building Types (retail stores, restaurants, religious buildings, recreation facilities, a bowling alley, and clubs)
- Family Housing Building Types (single-family homes and row houses)
- Unaccompanied Personnel Housing Building Types (bachelor enlisted and officer quarters)

6.4.3 Circulation and Parking Plan

No major circulation or parking issues have been identified at the installation. The Circulation and Parking Plan, shown on Figure 6-10, reflects existing conditions and the proposed access road and parking improvements associated with the projects shown on the Illustrative Plan.

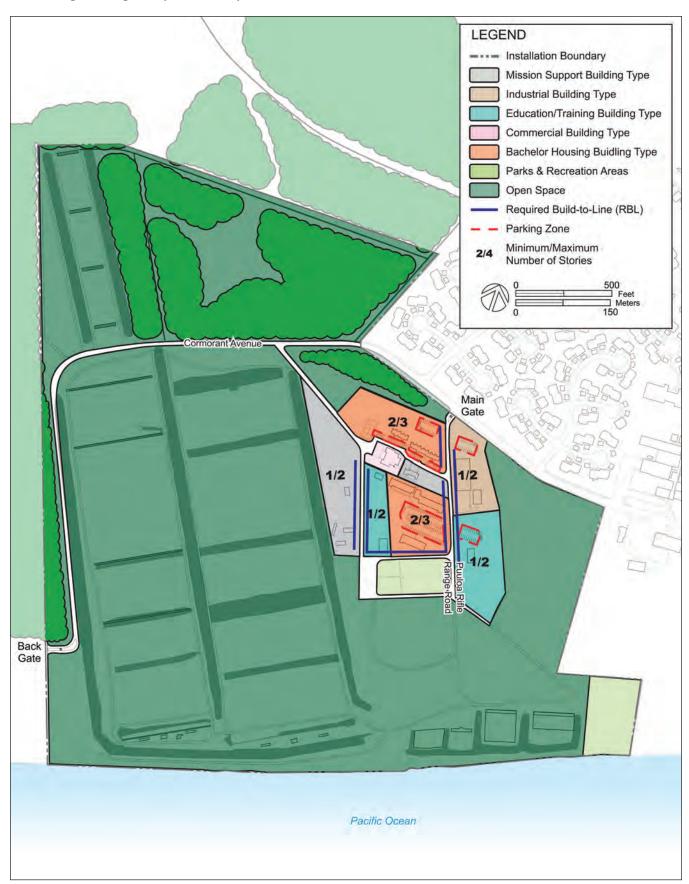


Figure 6-9 **Puuloa RTF Regulating Plan**

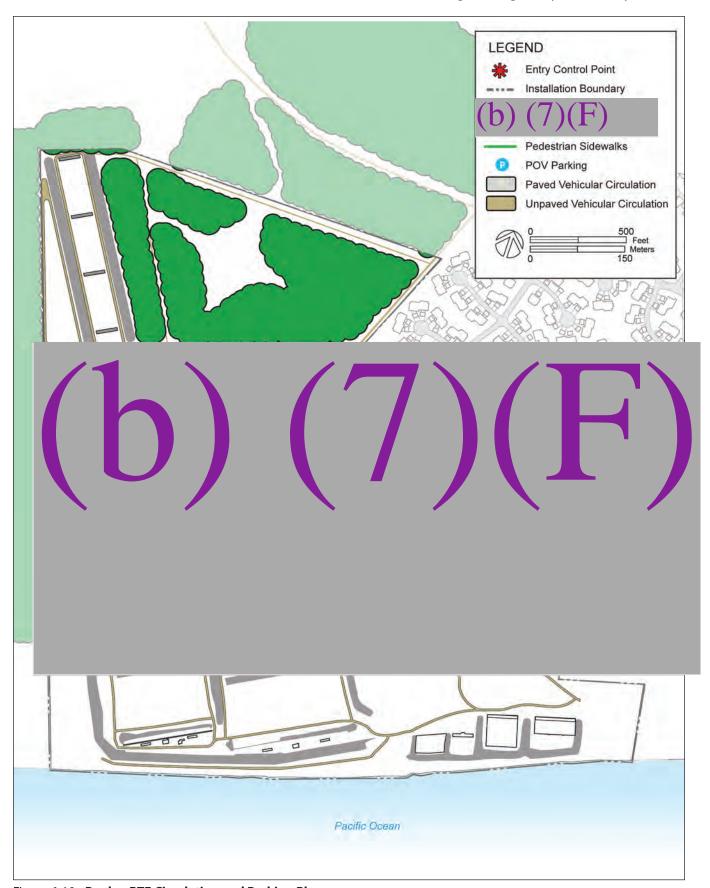


Figure 6-10 **Puuloa RTF Circulation and Parking Plan**

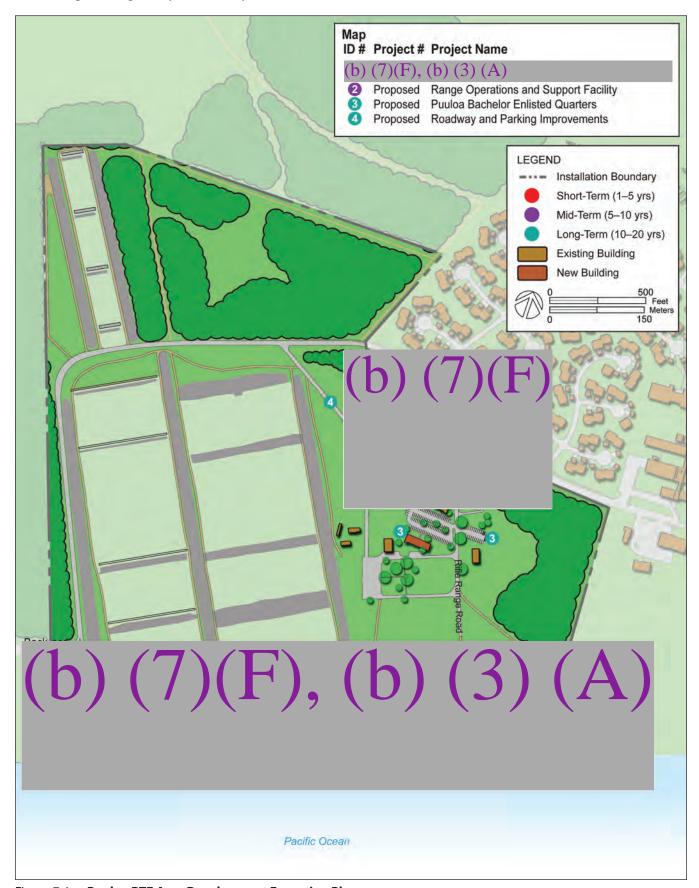


Figure 7-1 **Puuloa RTF Area Development Execution Plan**

7 Area Development Execution Plan

7.1 Execution Plan

The Area Development Execution Plan is a prioritized execution plan with ROM costs for the *Puuloa RTF ADP*. No dependent actions and project phasing are required for implementation of the proposed actions. The plan is presented graphically on Figure 7-1 and described in Table 7-1.

The timeframe of planning actions are classified as short-term (1–5 years), mid-term (5–10 years), or long-term (10–20 years) to reflect prioritization and phasing within the 20-year planning horizon of the ADP. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the ADP.

Table 7-1 **Summary of Proposed Development Actions**

MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE AND DESCRIPTION	ROM COST (\$K)
1	Short-term	P-931 Modified	Puuloa Range Comm/Elec & Gate Modernization Underground comm/electrical upgrades (b) (7)(F)	(b) (5)
2	Mid-term	Proposed	Range Operations and Support Facility Construct 9,900-sf ops facility Relocate target construction outside of SDZ 20-stall surface parking lot	
3	Long-term	Proposed	Puuloa Bachelor Enlisted Quarters Two-story, 10,300-sf transient BEQ 20-stall surface parking lot	
4	Long-term	Proposed	Roadway and Parking Improvements	

7.2 Demolition Plan

No demolition is proposed at Puuloa RTF.

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 $U.S.\ Navy\ photo\ by\ Mass\ Communication\ Specialist\ 2nd\ Class\ Jason\ Daniel\ Johnston/RELEASED.\ www.navy.mil/Particles and Particles

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Acronyms and Abbreviations

ac Acre/Acres SY Square Yard

BAFS Bellows Air Force Station UAS Unmanned Aerial System
CCH City and County of Honolulu UFC Unified Facilities Criteria

CCN Category Code Number UM Unit of Measure

CDP Census Designated Place U.S. United States of America

DoD Department of Defense VFR Visual Flight Rules

EA Each WWII World War II

EA Environmental Assessment

EIS Environmental Impact Statement

ESA Endangered Species Act

FSP Facilities Site Plan

ft Foot/Feet
FY Fiscal Year

HIARNG Hawaii Army National Guard

IFR Instrument Flight Rules

in Inch/Inches

ICRMP Integrated Cultural Resources

Management Plan

INRMP Integrated Natural Resources

Management Plan

IRP Installation Restoration Program

LZ Landing Zone

MCB Marine Corps Base

MCTAB Marine Corps Training Area Bellows

mi Mile/Miles

msl Mean Sea Level

MOUT Military Operations on Urban Terrain

NAVFAC Naval Facilities Engineering Command

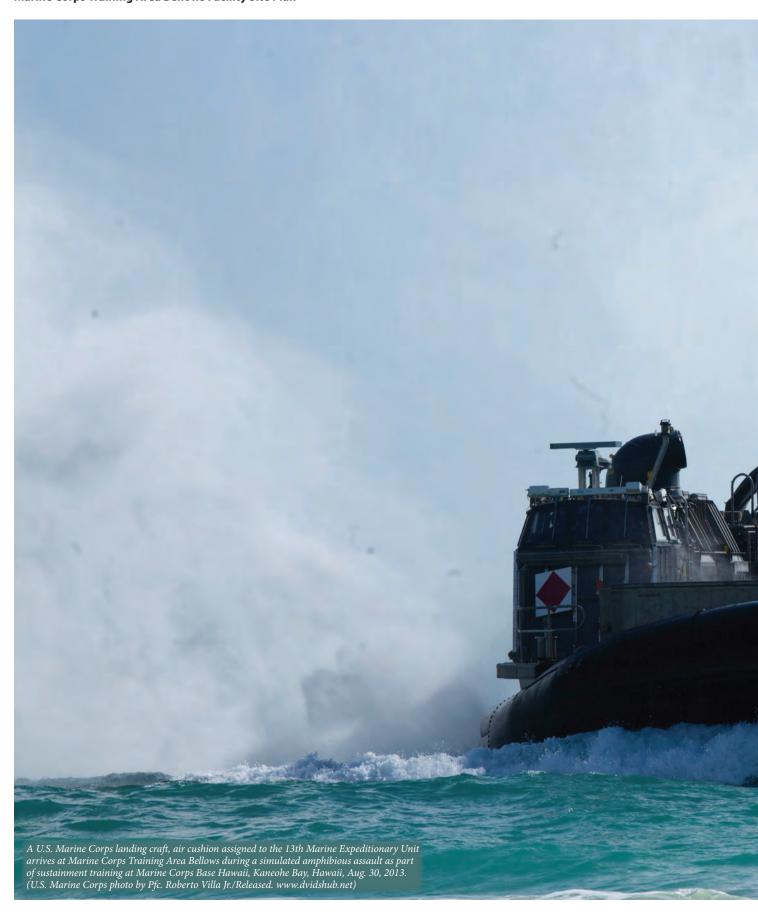
NRHP National Register of Historic Places

PN Personnel

ROM Rough Order of Magnitude

sf/SF Square Feet

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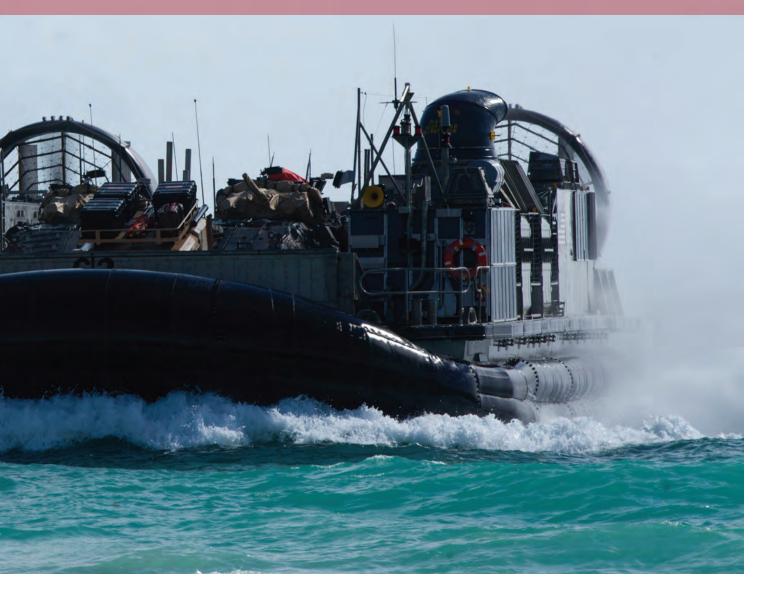


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Introduction

The Facility Site Plan (FSP) for the Marine Corps Base Hawaii (MCB Hawaii) Marine Corps Training Area Bellows (MCTAB) was prepared as part of a larger master planning process for MCB Hawaii that encompasses all Marine Corps installations and landholdings in the State of Hawai'i. The MCB Hawaii master planning process included data collection, analysis, visioning, and plan development.

The intent of this FSP is to articulate the vision, future land use, and development at MCTAB over the next 20 years. The MCTAB FSP discusses the vision for the area, reports facility requirements and assets, analyzes existing conditions, and presents the future development plan.



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Introduction



2 Section 1 | Vision Plan FOR OFFICIAL USE ONLY

1 Vision Plan

Marine Corps Training Area Bellows (MCTAB) shares the MCB Hawaii Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.1 Mission, Vision, Goals, and Objectives

MCTAB has its own planning mission and vision that take into consideration the unique mission, functions, location, and physical condition of the installation.

According to the *UFC 2-100-01, Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

The planning goals of MCTAB include the following.

- Create a secure training area
- Create a functional training area

The specific planning objectives of MCTAB include the following.

- · Upgrade landing zones for new aircraft
- Secure the property boundary
- Obtain adjacent lands to create a buffer from the surrounding community

Planning Mission

To provide ground, air, and amphibious training areas and opportunities

Planning Vision

In support of joint forces current and future missions, our planning vision is to create a secure, realistic, and functional training area

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1.2 Area Profile

1.2.1 Overview

MCTAB encompasses 1,074 ac along the shoreline between the communities of Kailua and Waimānalo. As shown on Figure 2, MCTAB is bordered by Waimānalo Bay to the east, Keolu Hills and Ka'iwa Ridge to the north and northwest, the central section of Waimānalo Stream and Olomana Golf Club to the southwest, and Waimānalo town and Waimānalo Bay State Recreation Area to the south. Bellows Air Force Station (BAFS), encompassing approximately 424 ac, is located along the northeast and southeast boundaries and includes Tinker Road. The main entry point to MCTAB is located near the intersection of Tinker Road and Kalaniana'ole Highway.

As a training area, MCTAB has no permanently stationed units or personnel. The primary users of MCTAB are operational elements stationed at MCB Hawaii and include combat, combat support, and combat service support units. These units use MCTAB throughout the year for training activities conducted by various sized groups that range from company-sized (about 120 personnel) to battalion-sized (about 900 personnel) for larger exercises.

In addition to the Marine Corps, other entities that use MCTAB for training include visiting Marine Expeditionary Units, the Army, the Navy, the Honolulu Police Department, and the Federal Bureau of Investigation. The beaches at MCTAB are used for Rim of the Pacific Exercise, a biennial international exercise hosted by the Navy to increase the tactical proficiency of military units by conducting a wide variety of maritime operations.

Due to its proximity to MCB Hawaii Kaneohe Bay, MCTAB is heavily used by the Marine Corps. MCTAB serves as the primary training area on Oʻahu, offering maneuver space for realistic, non-live fire military training activities including troop land maneuver training that can be combined with amphibious, helicopter, and motorized exercises. It is the only training area in the Central and Western Pacific where amphibious landings can transition directly into maneuver training areas in Hawaiʻi.

1.2.2 History

In 1917, *Presidential Executive Order 2565* established the Waimānalo Military Reservation on former plantation lands, which had previously been crown lands ceded to the federal government. The order stipulated that the lands were set aside for training use only. During the 1930s, Bellows Field was constructed (1933) and used for strafing and bombing practice by Army Air Corps detachments from Wheeler Field in central O'ahu, and for target practice by coastal artillery. On the morning of December 7, 1941, Japanese fighters attacked Bellows Field. In the days that followed, the military quickly mobilized, expanding one of the two runways in less than a week to accommodate the arrival of B-17 bombers from the mainland. In 1960, a transmitter complex and two Nike-Hercules surface-to-air missile sites were constructed; they were later closed in 1970.

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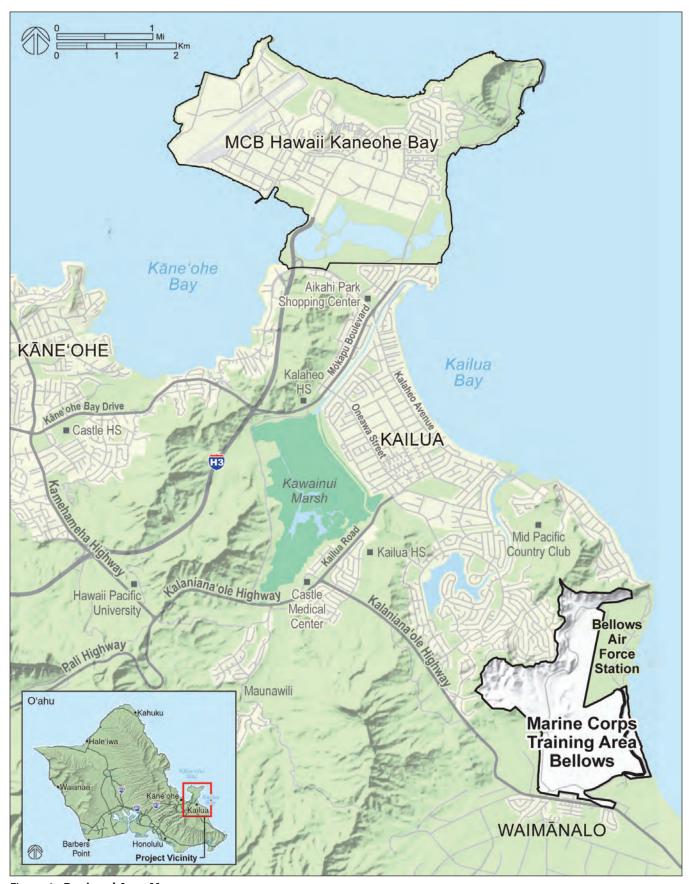


Figure 1 Regional Area Map

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Marine Corps use of Bellows (as a tenant to the Air Force) began in 1951 when the runway was the site of air-to-ground training. After the war, the Air Force was established as an independent service, and the Army Air Corps Bellows Field was renamed Bellows Air Force Base and, subsequently, redesignated Bellows Air Force Station when its runways were closed in the late 1950s. In January 2000, the Air Force transferred 1,049 ac to MCB Hawaii formally establishing Marine Corps Training Area Bellows. A few years later, the Air Force transferred 25 ac on the southern boundary to MCB Hawaii for use as a buffer to the town, increasing the total acreage of MCTAB to 1,074 ac.

1.2.3 Community Profile

MCTAB is located in Waimānalo, a census-designated place (CDP) in the City & County of Honolulu, in the District of Koʻolaupoko on the island of Oʻahu. According to the 2010 Census, the Waimānalo CDP had a population of 5,451. Adjacent and nearby land uses are primarily low-density residential and open space/preservation, as well as agriculture, parks, and golf courses. Waimānaloʻs major industry is agriculture with mainly nurseries and small farms. Commercial development is largely located along Kalanianaʻole Highway.

The nearest town is Kailua, a CDP located between MCB Hawaii Kaneohe Bay and MCTAB. According to the 2010 Census, the Kailua CDP had a population of 38,635. Kailua's major industry is commercial retail and tourism.

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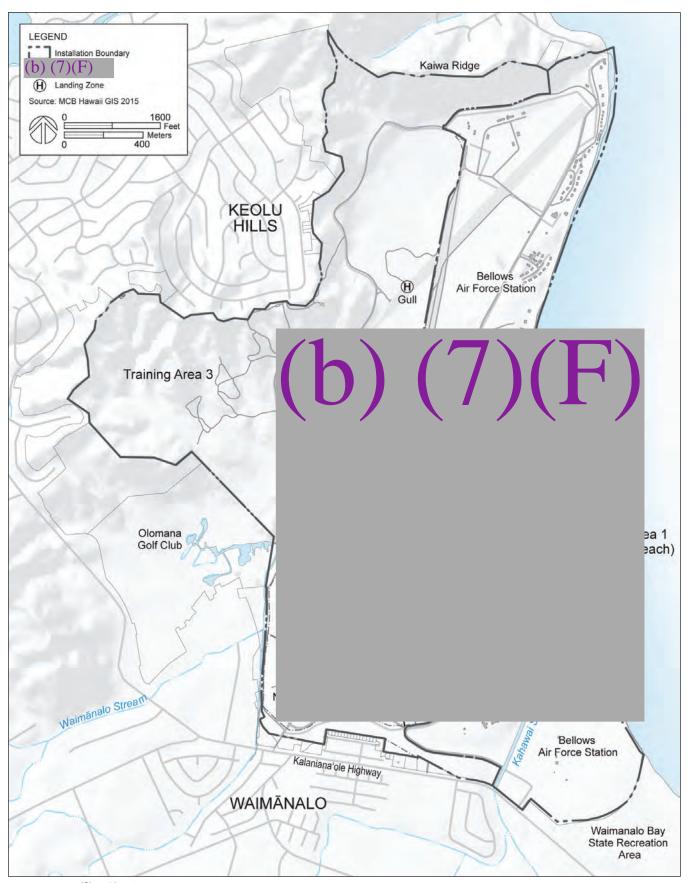


Figure 2 Facility Site Base Map

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2 Facility Requirements and Land

2.1 Assets

Major assets at MCTAB, shown on Figure 2, include training and maneuvering areas, Military Operations on Urban Terrain (MOUT) sites, and landing zones. The controlled airspace over MCTAB provides opportunities for coordinated air and ground training operations.

2.1.1 Training and Maneuvering Areas

MCTAB is divided into three primary training areas: Training Area 1 (Bellows Beach), Training Area 2 (southern portion of MCTAB), and Training Area 3 (northern portion of MCTAB). The three training areas are able to facilitate the concurrent training of multiple units including company-size amphibious assaults and raids; helicopter training to include assault landings, low-level flight training, and special patrol insert/extract; small unit offensive and defensive tactics; land navigation; patrolling; non-firing artillery training; combat vehicle operator course training; and command post exercises.

MCTAB is the only training area in the state that offers a nearby, readily available amphibious landing area with an adjacent tactical maneuver area. Amphibious training operations include "splashing" tracked amphibious vehicles from vessels in deep water, entering Waimānalo Bay through gaps in the reef, and then landing at designated areas on shore and proceeding inland.

MCTAB training areas offer off-road trails, fords, and the rough terrain, which provide suitable conditions for driver training courses.

The 22,540-sf, two-story Building 700 is the primary structure at MCTAB. It is situated at the intersection of two of the abandoned runways (3R/21L and 30/12) and contains a galley, administrative and classroom space, and bunkrooms/bedrooms.

Besides the three training areas, the Hawaii Army National Guard (HIARNG) operates a 48-ac training facility on lands leased from the Marine Corps. The HIARNG complex is home to the 298th Regiment's Regional Training Institute and includes administration offices, an auditorium, billeting, classrooms, a dining facility, parade and track field, and parking areas. The complex is separated by a fence and has secured gate access.

MCTAB is divided into three primary training areas which can accommodate the concurrent training of multiple units when needed.

- Training Area 1, Bellows Beach (43 ac)
- Training Area 2, southern portion of MCTAB (376 ac)
- Training Area 3, northern portion of MCTAB (582 ac)

The remaining lands at MCTAB are use for as a **Buffer Area**, (25 ac along southern boundary) and the **HIARNG** Regional Training Institute (48 ac).

2.1.2 Airspace and Landing Zones

MCTAB has four designated Landing Zones (LZs) called Hawk, Noni, Gull, Owl, and a drop zone called Tiger, which are all located on the deactivated runways. The LZs and drop zones primarily support rotary-wing aviation training; parachute training, which requires both land and water drop zones, is conducted from both utilize both fixed wing and helicopter aircraft.



MCTAB can support Unmanned Aerial System (UAS) training, which is not currently permitted at MCB Hawaii Kaneohe Bay. UAS flights are limited to the boundaries of MCTAB and must be conducted below 400 ft.

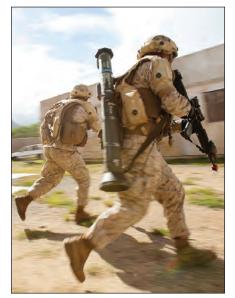
2.1.3 Military Operations in Urban Terrain Training Facility

MCTAB's MOUT facility is a Next Generation MOUT/Infantry Immersion Trainer comprised of three training sites designed to support enhanced company-level operations (USMC 2014). The MOUT is located on deactivated runways and consists of modular shipping containers developed to resemble an Afghan village that reflects operational environments that deploying forces may experience. The size of each training site varies, with 18, 16, or 21 structures and 456 separate rooms across all three sites.

The large Forward Operating Base–built around Building 700 in the southern runway complex–facilitates units conducting command post exercises.

2.2 Facility Requirements

Basic Facility Requirements for MCTAB were developed by a Naval Facilities Engineering Command (NAVFAC) Pacific asset evaluation in 2013. A summary of the major requirements is presented in Table 2-1 and reflect the existing surplus or deficit of assets for MCTAB.



Marines with first platoon, Charlie Company, 1st Battalion, 3rd Marine Regiment, dart across a danger area to clear remaining compounds in their area of operation at Marine Corps Training Area Bellows, Hawaii, Sept. 2013. (U.S. Marine Corps photo by Cpl. Matthew Callahan. www.mcbhawaii. marines.mil)

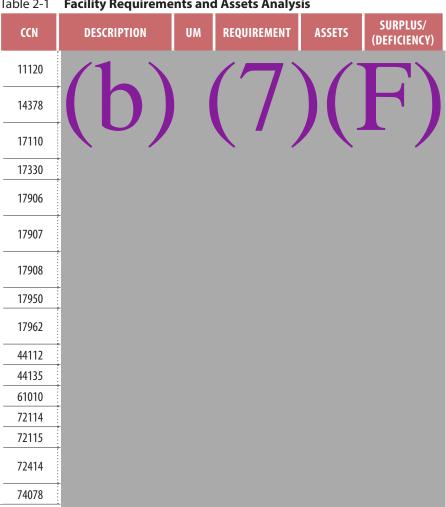


Table 2-1 **Facility Requirements and Assets Analysis**



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3 Data Collection

Interviews with the MCB Hawaii Facilities Department and Operations and Training Department were the primary source of information for the development of the MCTAB FSP. The plan was also based on the following sources of information.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The ICRMP documents the procedures and processes through which MCB Hawaii fulfills its commitment to compliance with applicable laws, regulations, and policies in the spirit of sound and responsible stewardship of cultural resources. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan (INRMP) Update, 2012–2016. November 2011.

The INRMP guides implementation of MCB Hawaii integrated natural resources management program on MCB Hawaii properties. INRMPs must support "no net loss" in capability of the installations' lands and waters to support military readiness while complying with a suite of federal laws governing natural resources management and stewardship, and public access to the same, subject to safety, environmental, and military security constraints.

Department of the Navy. Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i. Volumes I and II. June 2012.

The EIS was prepared to assess potential environmental impacts associated with the proposed basing of the MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. Operational requirements associated with this proposed action were identified in order to conduct a systematic analysis to identify suitable basing locations. As a result of this analysis, only one installation met all requirements—MCB Hawaii Kaneohe Bay.

Department of the Navy; U.S. Marine Corps Forces, Pacific; and Marine Corps Base Hawaii. United States Marine Corps Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study. March 2014.

The purpose of the study is to provide a series of recommendations for the Marine Corps to prioritize and pursue that will aid in the sustaining of future Marine Air Ground Task Force training in the Hawaiian Islands.

Department of the Navy, Naval Facilities Engineering Command Pacific. Marine Corps Base Hawaii Plus-Up Development Plan. Prepared by Belt Collins Hawaii. August 2012.

The Plus-Up Plan, which supplements the MCB Hawaii Master Plan (December 2006), documents the need for and identifies facility improvements arising from the Marine Corps' Grow the Force/202K initiatives, the Marine Aviation Plan, and



A Landing Craft Air Cushion, embarked from the USS Rushmore, prepares to land during the 2014 Rim of the Pacific exercise aboard Marine Corps Training Area Bellows in Waimānalo, Hawaiʻi, July 2014. (U.S. Marine Corps photo by Lance Cpl. Aaron Patterson. www.mcbhawaii.marines.mil)

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changes to Navy units stationed at MCB Hawaii Kaneohe Bay. The study area encompasses those installations under MCB Hawaii control affected by Plus-Up, including MCB Hawaii Kaneohe Bay, Camp Smith, MCTAB, Pearl City Annex, Puuloa Range Training Facility, and Molokai Training Support Facility.

U.S. Marine Corps Forces, Pacific. United States Marine Corps O'ahu Land Use Study. Prepared by Helber Hastert & Fee, Planners. December 2013. The study investigated the potential for Department of Defense (DoD) lands on the island of O'ahu to accommodate the Defense Policy Review Initiative proposal to relocate seven units of the III Marine Expeditionary Force from Okinawa, Japan, to O'ahu between 2026 and 2031.

U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The study supports an ongoing DoD process to evaluate the realignment of forces in the Pacific Region. Development of the study involved an evaluation of existing conditions at MCB Hawaii, including land at Peal City Annex and Manana Housing Area; identification of underutilized lands; verification of proposed near-term projects essential to continuation of operations at MCB Hawaii; and analysis of the feasibility of additional units at the base and their potential impact on quality of life at MCB Hawaii. The study is intended to provide Marine Corps leadership with a sense of the "art of the possible" as it relates to the future buildup of forces in Hawai'i.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

The framework of the Master Plan is a land use scheme that meets future requirements while efficiently utilizing existing assets. Plan recommendations are intended to consolidate and improve unit integrity and operations, provide sufficient land for training areas and support facilities, and ensure that environmental quality is not degraded and, where possible, is enhanced.

Department of the Navy, Naval Facilities Engineering Command Pacific Division. Marine Corps Training Area Bellows Master Plan. January 2002.

The Master Plan provides "a broad analysis to guide orderly development of mid- and long-range projects and land use at MCTAB." The document includes information on existing facilities and conditions, land use, training activities, environmental conditions and constraints, and proposed training and land use.

4 Site Analysis

This section describes the existing land use; archaeological, cultural, and historic resources; and environmental conditions and constraints at MCTAB. The location of various land uses and facilities is shown on Figure 2.

4.1 Land Use

Land at MCTAB is primarily used for training and/or as buffer areas to the surrounding community. The adjacent BAFS is used for recreation and provides additional buffer areas to the south. All land at MCTAB and BAFS is held in fee simple ownership by the U.S. Government. Tinker Road is the primary vehicular access road to MCTAB from Kalaniana'ole Hwy.

4.1.1 Training Areas

MCTAB's built environment is comprised of abandoned runways used as landing zones during training exercises, training facilities, and large swaths of undeveloped areas covered in vegetation. The beach area is used to conduct amphibious training operations, while the inland area is used for aviation training, parachute activities, ground maneuver tactical training, and classroom instruction. Inland areas also include billeting, dining, and equipment maintenance facilities that are utilized during extended training exercises. MCTAB is divided into three primary training areas.

Training Area 1, also called Bellows Beach, covers approximately 43 ac of beach area from the high water mark to Tinker Road. There are two tracked vehicle crossing over the beach in support of amphibious assault training.

Training Area 2 covers 376 ac in the southern portion of MCTAB adjacent and inland of Training Area 1. There are two landing zones, three partially overgrown runways (3R/21L, 6/24, and 30/12), and two buildings (Buildings 700 and 701), which support aviation training activities, garrison training, and tactical operations.

Training Area 3 encompasses 582 ac of scrubland and abandoned runways (3L-21R) on a mix of flat and hilly terrain in the western and northern portion of MCTAB. The area is primarily accessed from a single bridge across Waimānalo Stream. There are dirt trails that can access the ridge tops bordering Keolu Hills and 'Olomana Golf Club. This area contains old WWII bunkers, igloos, and airplane revetments.

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4.1.2 Recreational Uses

Public use of the beach area is allowed during weekends and most holidays when training activities are not being conducted and/or are restricted to other areas. While the beach fronting MCTAB is open to the public for recreational use, access to the inland area remains restricted under an agreement with the City and County of Honolulu (CCH). Public uses include day use—primarily beach activities and picnicking—and overnight camping in designated areas by permit issued by the county. The county is responsible for maintaining the area, restroom facilities and infrastructure; and security of the area.¹

4.1.3 Buffer Areas

A narrow, 25-ac section of MCTAB—located at the southwestern corner of the installation along Kalaniana'ole Highway—serves as a buffer to neighboring civilian uses. MCB Hawaii is currently under negotiations to transfer 1.6 ac to the State of Hawai'i for the Waimanalo Health Center.

Although used periodically for land-based navigation training by the Marines, the former Nike missile launch site located in the south portion of BAFS is vacant and serves primarily as a buffer to the adjacent Waimanalo Bay State Recreation Area.

4.1.4 Other Uses

The 2006 MCB Hawaii Master Plan identified other uses at MCTAB including commercial telecommunication services that are clustered in a single location along the ridge of Keolu Hills, which marks the northern inland boundary of MCTAB; a University of Hawai'i research station (which includes approximately 8,600-sf of beach area) located near the gate to the military recreation area; and a small cemetery that dates back to the early 20th century.

4.2 Archaeological, Cultural, and Historic Resources

Figure 3 depicts MCTAB's archaeological, cultural, and historic resources. According to the MCB Hawaii ICRMP, archaeological evidence suggests that the MCTAB area was settled as early as AD 1040–1219 with permanent occupation that developed along central and upper Puhā Stream (now called Waimānalo Stream). During the second half of the 19th century, areas around Puhā Stream transitioned from ranching, to rice cultivation, and, finally, to commercial sugar operations. During the late 19th century, a church, school, and cemetery were constructed south of Puhā Stream. The Waimānalo Japanese Cemetery, located on 1.4 ac adjacent to the former runway, contains 45 burial markers; there are also unmarked burials that may account for an additional 150 to 200 individuals.

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¹ MCTAB Training Area 1 Recreation Use Feasibility Study, 2010.

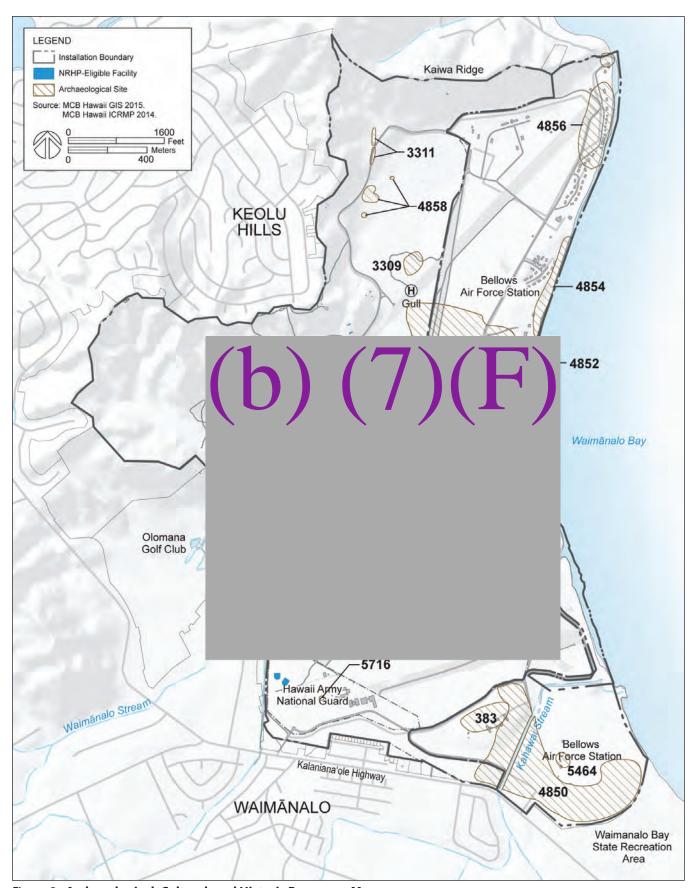


Figure 3 Archaeological, Cultural, and Historic Resources Map

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In 1973, the Bellows Field Archaeological Area (Site 50-80-15-511) was listed on the National Register of Historic Places (NRHP). Although listed on the NRHP, subsequent analysis of site boundaries at MCTAB has resulted in a more refined delineation of sites in the archaeological landscape consisting of 13 archaeological sites and complexes. These sites can be characterized by the period of use: traditional Hawaiian from pre-Contact to 19th century; plantation era from the second half of the 19th century into the 20th century; and military era during the 20th century.

In addition to archaeological sites, NRHP-eligible historic architectural properties at MCTAB consist of Cold War and WWII era structures including the Building 700 complex, revetments, and concrete bunkers. See Figure 3 for delineation of archaeological sites and location of NRHP-eligible historic structures.

According to the USMC Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study, "Current training does not generally affect the subsurface, where the majority of the cultural features are present, because no live-fire training or high explosive munitions are used, and vehicular traffic is limited to the beach, a path crossing Tinker Road, and existing roads, runways, and taxiways. Increased training at MCTAB is unlikely to impact cultural resources unless range-related construction is required or additional types of munitions are used. Additional cultural resource surveys and Section 106 consultations may be required before expanding training outside currently approved areas."

4.3 Environmental Conditions and Hazards

The following sections and Figure 4 describe the existing environmental conditions and hazards at MCTAB.

4.3.1 Climate

In the vicinity of MCTAB, the median annual rainfall is approximately 42 in.² Monthly average high and low air temperatures at MCTAB range from 74 to 83 degrees Fahrenheit in the warmest month (August) and from 67 to 76 degrees Fahrenheit during the coolest month (January).³

Waimanalo Rainfall Station. Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

³ Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.

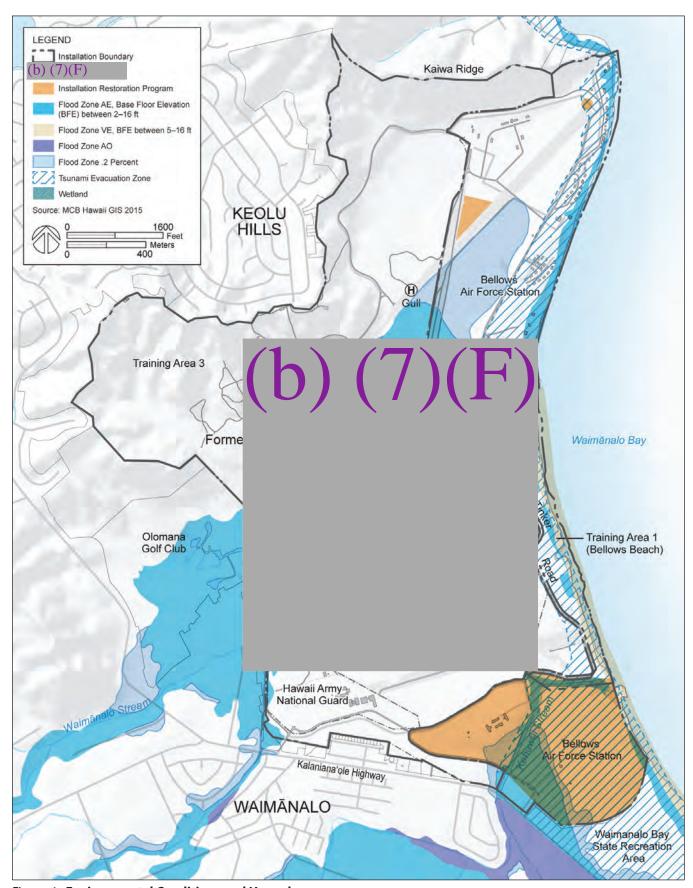


Figure 4 Environmental Conditions and Hazards

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4.3.2 Topography

MCTAB is located in the lower coastal plains of Waimānalo Valley, with a steep-sided valley and a relatively level bottom. The coastal area is relatively flat ranging from the dunes at sea level to about 25 ft above mean sea level (msl) toward the central area of the installation. The north and west portions of the area rise to Ka'iwa Ridge and the crest of Keolu Hills with elevations above 400 ft above msl.

4.3.3 Soils/Geology

Figure 5 depicts the location of MCTAB's various soil types. The 2006 MCB Hawaii Master Plan describes the soils at MCTAB to be "highly permeable sands located along the shoreline extending inland to the east branches of the northern runways and subject to very slow to slow runoff." They present a slight water erosion hazard, as well as a severe wind erosion hazard in areas where vegetation has been removed. Workability on sands is slightly difficult because the soil is loose and lacks stability for the use of equipment. Mixed fill land, typically used for urban development occurring adjacent to the ocean, occupies the area that contains the three southern runways.

The fill (FL) material consists of material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources, resulting in variable soil characteristics. In addition, several pockets of coral outcrops (CR) are found in the central and southern sections of MCTAB. Coral outcrops are formed when the reef builds up in shallow ocean water during a period of high sea level and primarily consist of coral or cemented calcareous sand.

The northern portion of MCTAB, including the area north and west of the northern runways and the base of Keolu Hills, is dominated by moderately well-drained loams and stony clays of slow to moderate permeability that are subject to medium runoff and pose a moderate erosion hazard. Well-drained clay loams of moderate permeability occupy small areas located in the central and southern areas of MCTAB and are subject to slow runoff and pose a slight erosion hazard. Moderately permeable silty clays are found along the banks of Waimānalo Stream, and are subject to very slow runoff and pose no more than a slight erosion hazard.

4.3.4 Hydrology

4.3.4.1 Offshore Waters

MCTAB encompasses approximately one mile of Waimānalo Bay's coastline. The 2002 MCTAB Master Plan describes the offshore waters, "The inner bay is separated from the ocean by a shallow barrier reef that absorbs much of the incoming wave energy. The seafloor within the nearshore area of the Bay generally ranges from 10–20 ft in depth and is composed predominantly of sand and coral limestone benches. The nearshore area is a wide, sandy, flat area extending approximately

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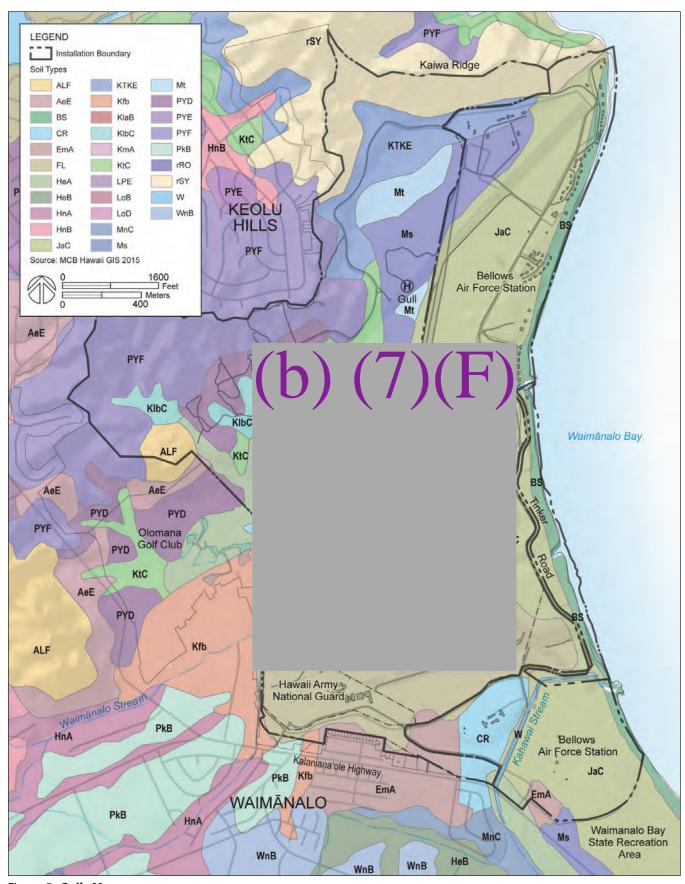


Figure 5 Soils Map

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495 ft from the shore. The coral reef zone extends to about 2 mi out from the shoreline. Tidal mean range at Bellows is about one foot."

4.3.4.2 Stormwater Runoff

Much of the coastal plain area is covered by impermeable surfaces such as roads and runways. Stormwater runoff moves across the surfaces in sheet flow to surrounding unpaved areas where it infiltrates into the soil or drains into streams, ponds, or natural depressions. According to the INRMP, the natural watershed and morphology of Waimānalo Stream and its tributaries have been modified due to past land management practices. These streams are prone to flooding, weed encroachment, and sedimentation, which reduce their ability to store excess water and sediment.

4.3.4.3 Groundwater

Low level brackish groundwater at MCTAB is generally found at or below msl in marine sedimentary materials and alluvium along the coastline. Aquifer classification for the coastal area is unconfined basal in sedimentary soils and brackish. Basal is fresh water in contact with seawater; unconfined is where the water table is the upper surface of the saturated aquifer.

4.3.4.4 Wetlands

The Marine Corps and Air Force each have separate INRMPs for their respective parcels, MCTAB and BAFS. There are two designated wetlands along Waimānalo Stream named Puhā 'Ekahi and Puhā 'Elua on land under the control of MCTAB. A third wetland, near the mouth of Waimānalo Stream, is on land under the control of BAFS.

According to the MCB Hawaii INRMP, mangrove encroachment remains a major threat to MCTAB wetlands. Mangrove restricts water flow, degrades water quality and wildlife habitat, and augments upstream flooding risk and health risks along Waimānalo Stream. The core area of mangrove infestation, with the largest concentration of mature mangrove trees, is in the Lower Waimānalo Stream (oxbow) wetland within Bellows AFS jurisdiction. This mangrove thicket provides a seed bank for infesting MCTAB's nearby wetlands (Puhā 'Ekahi and Puhā 'Elua).

4.3.5 Vegetation

According to the INRMP, the majority of the vegetation at MCTAB consists of introduced species. No Endangered Species Act (ESA) listed plant species have been identified at MCTAB.

Invasive plant species, in particular guinea grass, are a concern at MCTAB and pose a potential wildfire risk. Appropriate controls and management practices are in place to prevent the spread of invasive species. Recommendations in the INRMP included planting and maintaining "native or other less fire prone, noninvasive ground cover (where practicable) to replace more fire-prone invasive grasses." Additionally, priority locations have been identified and mapped based on military operator use and frequency and degree of wildfire risk.

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4.3.6 Wildlife Habitat

4.3.6.1 Fauna

According to the INRMP, 25 species of birds protected by the Migratory Bird Treaty Act and five animal species protected by the ESA have been observed at MCTAB. This includes four endangered resident native waterbirds and the threatened Newell's shearwater. The endemic short-eared owl, a state-listed endangered species, has also been identified at MCTAB. The listed birds would more likely be found in the wetlands; however, marines are more likely to train in the drier portions of MCTAB, such as the MOUT site, LZs, and former runways.

4.3.6.2 Marine Life

According to the INRMP, the waters off MCTAB are home to three ESA-listed endangered marine animal species including the endemic Hawaiian monk seal, the humpback whale, and the hawksbill sea turtle. The green sea turtle, listed as a threatened species, frequents Waimānalo Bay. Monk seals and turtles have been infrequently reported as hauling out along the shoreline of MCTAB.

Training participants would most likely encounter the Hawaiian monk seal or sea turtles on the adjacent beach or offshore in Waimānalo Bay. Encounters may occur during amphibious landings, which are infrequent and over short durations.

4.3.7 Noise

Noise is generated by training operations including amphibious landing craft, helicopters, and blank gunfire. Exposure to the surrounding community of noise resulting from training activities is minimized by noise buffers and restrictions on uses of land near the boundaries of the property. Helicopters typically enter and exit MCTAB from the northeast transiting over Waimānalo Bay. Most aviation activities occur during daylight hours from 7 a.m. to 10 p.m.

4.3.8 Hazardous Waste

The management of hazardous waste at MCTAB follow the responsibilities, requirements, and procedures described in the MCB Hawaii Hazardous Waste Management Plan (April 2012). All hazardous materials and waste are managed in accordance with applicable laws and regulations. Activities at MCTAB generate minimal waste. There currently is no waste accumulation point established at MCTAB.

4.3.9 Installation Restoration Program

MCTAB has 17 Installation Restoration Program (IRP) sites. Land use controls are currently in effect at two sites. The remaining IRP sites have either been closed in place or do not require further action.

Land use controls for the former landfill sites, LF01 and DA101, are used to minimize human exposure to contaminated surface soils and listed in the *Record of Decision Sites LF-1 and DA101* (November 2006). Overall, development

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in and around the sites should be avoided. Land use controls that impact development at the sites include the following.

- A work authorization process for construction or excavation projects involving intrusive subsurface activities
- Preventing use of areas with lead contamination above 400 gm/kg for residential activities and preventing removal of site soil

4.3.10 Utilities

MCTAB has basic utilities including potable water and electricity. CCH Board of Water Supply provides potable water to MCTAB. Electrical power is purchased from Hawaiian Electric Company. The water system is deficient in pressure and flow for general fire fighting. Coordination with the Air Force is required to address this issue.

Wastewater disposal consists of septic tanks and leach fields. MCTAB does not have a central collection system or treatment plant, and wastewater is pumped off-site for treatment. Solid waste is taken to the CCH Kapaa Refuse Transfer Station or the Waimanalo Gulch Sanitary Landfill for disposal.

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5 Facility Site Development Plan

The Development Plan introduces a prioritized execution plan with rough order of magnitude (ROM) costs for MCTAB in the context of the installation's existing Capital Improvement Program. Elements of the Development Plan are detailed in Table 5-1, Summary of Proposed Development Actions and presented graphically on Figure 6, MCTAB Facility Site Development Plan. Table 5-1 describes each planning action.

The Facility Site Development Plan presents actions to meet the objectives outlined in Section 1.1. The time frame of each planning action is classified as short-term, mid-term, or long-term to reflect prioritization and phasing over the next twenty years. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the FSP. Short-term actions consist primarily of existing projects developed as part of the installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. No demolition actions are proposed or planned.

Table 5-1 Summary of Proposed Development Actions

MAP ID	TIME Frame	MCB HAWAII PROJECT#	PROJECT TITLE & DESCRIPTION	ROM COST (\$K)
1	Short-term FY18	P-887	(b) (7)(F)	(b) (5)
2	Short-term	P-947		
3	Mid- to long- term	not applicable	Transfer Air Force Lands to the Marine Corps • Obtain southern portion of BAFS, approximately 136 ac, for buffer and training area	not applicable

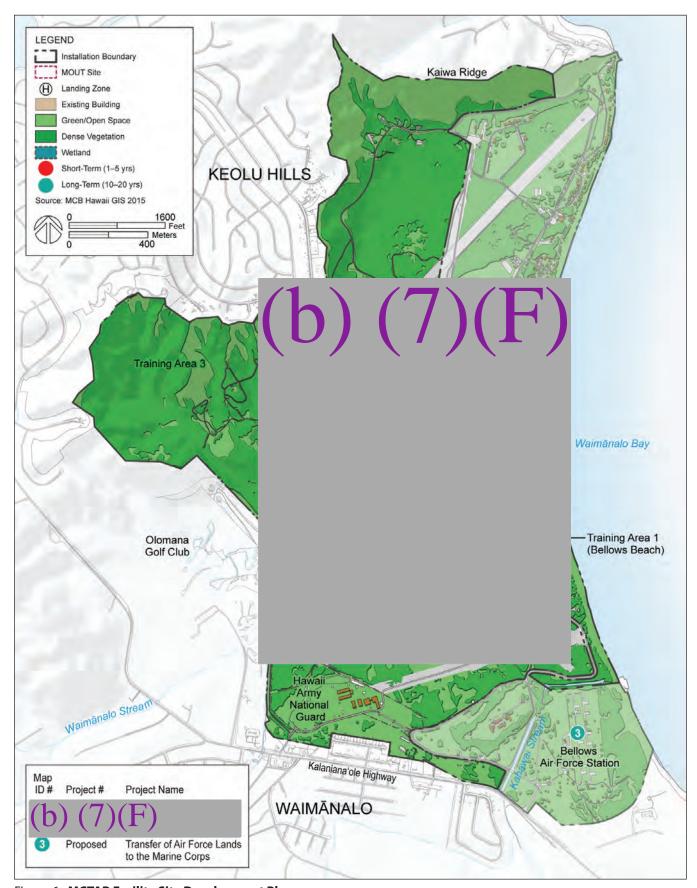


Figure 6 MCTAB Facility Site Development Plan



Photo by HHF Planners

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Acronyms and Abbreviations

ac Acre/Acres

CCH City and County of Honolulu

CCN Category Code Number

CDP Census Designated Place

DoD Department of Defense

FSP Facilities Site Plan

ft Foot/Feet
FY Fiscal Year

HECO Hawaiian Electric Company

in Inch/Inches

ICRMP Integrated Cultural Resources

Management Plan

INRMP Integrated Natural Resources

Management Plan

kV Kilovolt

MCB Marine Corps Base

MEC Munitions and Explosives of Concern

mi Mile/Miles

MVA Megavolt Ampere

NAVFAC Naval Facilities Engineering Command

NRHP National Register of Historic Places

PCA Pearl City Annex

PCP Pearl City Peninsula

PV Photovoltaic

ROM Rough Order of Magnitude

sf Square Feet

UFC Unified Facilities Criteria

UM Unit of Measure
WWII World War II

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Marine Corps Base Hawaii Installation Master Plan **Pearl City Annex Facility Site Plan**

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1 Vision Plan

PCA shares the Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.1 Mission, Vision, Goals, and Objectives

PCA has its own planning mission and vision that take into consideration the unique mission, functions, location, and physical conditions.

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

The planning goals of PCA include the following.

- Maintain a secure area to support long-term storage needs.
- Identify opportunities for renewable energy resources.

The specific objectives include the following.

- Provide storage area for long-term deployment parking.
- Incorporate photovoltaic (PV) systems for renewable energy onto covered parking.

1.2 Area Profile

1.2.1 Overview

PCA encompasses 27 ac within the Pearl Harbor Naval Complex on the Pearl City Peninsula (PCP). PCA is located along the coast of the East Loch of Pearl Harbor. Navy family housing lies to the south and the former Naval Fuel Supply Depot in Pearl City is located to the west of PCA across Lehua Avenue. The Takano Nakamura landscaping company is adjacent to the north boundary. PCA is approximately 22 mi from MCB Hawaii Kaneohe Bay. The only access to the site is via the narrow two-lane Lehua Avenue through a low-rise mixed residential neighborhood.

PCA is a warehouse complex used for storage by Marine units, the Navy, and other military organizations including Marine Corps Community Services, Tactical Engagement Simulation System, and Ohana Military Communities. PCA is owned in fee simple by the Marine Corps and consists of three covered warehouses, two open-sided sheds, and a flammable storage structure.

Planning Mission

To provide secure warehouse and multi-use spaces to tenant units that protect assets from loss and tempest hazards

Planning Vision

In support of current and future missions, our planning vision is to create a secure, safe, and sustainable equipment and material storage complex and deployment lot

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Section 1 | Vision Plan

1.2.2 History

PCA warehouses were among the first new facilities developed on the peninsula in the aftermath of Japan's attack on Pearl Harbor. During this time, the Navy built up the storage capability, along with air raid shelters, dispersed throughout O'ahu as a precaution against future attacks. Initially named Storehouse Area Pearl City, Supply Department Storage Area, the warehouses were used for salvage storage as part of the effort to salvage the remains of the Navy fleet following the attack. After the Pearl Harbor attack, the area became known as the Naval Supply Depot Pearl City Storage Area and was used for a variety of storage functions to supply the forward bases in the Pacific. Upon the conclusion of World War II (WWII), there was little apparent activity at PCA with limited use by the Marine Corps.

1.2.3 Community Profile

PCA is located in the Pearl City census designated place (CDP) in Leeward, O'ahu. According to the 2010 census, the CDP had a total population of 47,698. The town of 'Aiea borders Pearl City to the east, while Waipahu borders it to the west. Residential, commercial, and industrial uses are located in the vicinity, including Pearl Highlands Center and major retailers along Kuala Street north of PCA. The CDP includes several public elementary schools, Pearl City High School, and Leeward Community College.

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Figure 1 Regional Area Map

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Section 1 | Vision Plan

Pearl City Annex Facility Site Plan

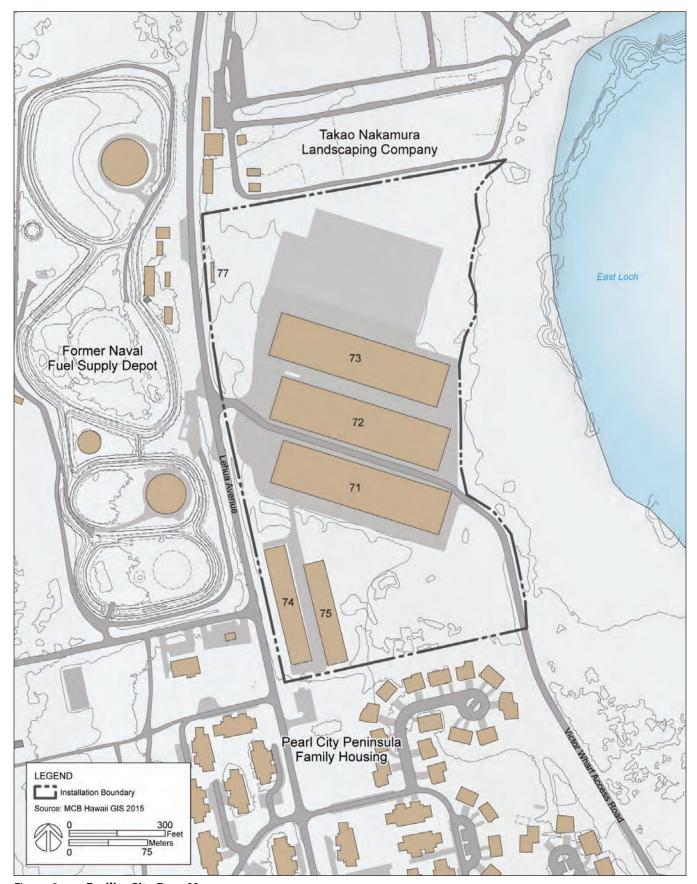


Figure 2 Facility Site Base Map

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2 Facility Requirements and Land

2.1 Assets

PCA has three large warehouses, two open storage sheds, and a flammable storage structure. The warehouses provide over 250,000 sf of storage space; most of the material stored is overflow from MCB Hawaii Kaneohe Bay.

2.2 Facility Requirements

Basic Facility Requirements for PCA were developed by a Naval Facilities Engineering Command (NAVFAC) Pacific asset evaluation in 2013. A summary of the major requirements are presented in Table 2-1 and reflect the existing surplus of assets for PCA.

Table 2-1 Facility Requirements and Assets Analysis

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS
14377	Operational Storage	SF	1,300	4,065	2,765
17320	Training Aids Center	SF	14,088	16,228	2,140
44112	Marine Corps Unit Storage	SF	28,400	164,702	136,302
74085	Exchange Distribution Warehouse	SF	31,500	69,133	37,633



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3 Data Collection

Interviews with MCB Hawaii Facilities Department were a primary source of information for the development of the PCA Facility Site Plan. This FSP was also based on the following source of information.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The ICRMP documents the procedures and processes through which Marine Corps Base Hawaii fulfills its commitment to compliance with applicable laws, regulations, and policies, in the spirit of sound and responsible stewardship of cultural resources. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan (INRMP) Update, 2012–2016. November 2011.

The INRMP guides implementation of MCB Hawaii integrated natural resources management program on MCB Hawaii properties. The INRMP must support "no net loss" in capability of the installations' lands and waters to support military readiness while complying with a suite of federal laws governing natural resources management and stewardship and public access to the same, subject to safety, environmental, and military security constraints.

Department of the Navy, Naval Facilities Engineering Command Pacific. Marine Corps Base Hawaii Plus-Up Development Plan. Prepared by Belt Collins Hawaii. August 2012.

The Plus-Up Plan, which supplements the *MCB Hawaii Master Plan* (December 2006), documents the need for and identifies facility improvements arising from the Marine Corps Grow the Force/202K initiatives, the Marine Aviation Plan, and changes to Navy units stationed at MCB Hawaii Kaneohe Bay. The study area encompasses those installations under MCB Hawaii control affected by Plus-Up, including MCB Hawaii Kaneohe Bay, Camp H.M. Smith, Marine Corps Training Area Bellows, PCA, Puuloa Range Training Facility, and Molokai Training Support Facility.

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The study supports an ongoing DoD process to evaluate the realignment of forces in the Pacific Region. Development of the study involved an evaluation of existing conditions at MCB Hawaii, including land at PCA and Manana Family Housing Area, identification of underutilized lands, verification of proposed near-term projects essential to continuation of operations at MCB Hawaii, and analysis of the feasibility of additional units at the base and their potential impact on quality of life at MCB Hawaii. The study is intended to provide Marine Corps leadership with a sense of the "art of the possible" as it relates to the future buildup of forces in Hawai'i.

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The framework of the Master Plan is a land use scheme that meets future requirements while efficiently utilizing existing assets. Plan recommendations are intended to consolidate and improve unit integrity and operations, provide sufficient land for training areas and support facilities, and ensure that environmental quality is not degraded and, where possible, is enhanced.

4 Site Analysis

This section describes the existing land use; archaeological, cultural, and historic resources; and environmental conditions and constraints at PCA.

4.1 Land Use

PCA is located on a peninsula surrounded by Pearl Harbor's East and Middle Lochs. The waterfront is accessed via Victor Wharf Access Road, which divides PCA and provides direct access to Victor Wharf on the east coast of the peninsula. The primary land use at PCA is light industrial, comprised exclusively of warehouses and open storage.

4.2 Archaeological, Cultural, and Historic Resources

According to the MCB Hawaii ICRMP, settlement of the peninsula was influenced by the presence of wetlands that were fed by springs and Waiawa Stream. Subsistence complexes, taro fields, and fishponds, were important traditional Hawaiian assets. There were at least four major ponds and several smaller ones integrated into the taro complexes on the peninsula. In addition to these resources, fishers located in the lagoon served as collection units for fish and other marine supplies.

In the 19th century, commercial development of subsistence activity and changes in population and land tenure brought on a major shift in the landscape of the peninsula and the surrounding lagoons. Pearl Harbor, with its calm waters and convenient location to central Oʻahu, became the primary locus for sandalwood collection and storage from early 1800s to the 1840s.

4.2.1 Archaeological Resources

According to the ICRMP, there are no identified archaeological sites within the highly developed area of PCA, although subsurface deposits, related to wetland agricultural use, may still be preserved under modern structures. As of June 2014, no cultural resource studies or archaeological inventory/data recovery investigations had been completed.

4.2.2 Architectural Resources

The five 1942–43 WWII warehouse structures (Buildings 71–75) and the air raid structure (Building 77) are eligible for listing on the National Register for Historic Places (NRHP) as they appear to retain historic integrity and are potentially significant for their role in providing supplies storage during WWII. Over 300 arched air raid shelters were built after the Japanese attack on Pearl Harbor. Building 77 is one of sixteen remaining shelters on O'ahu and one of only two with the original extended entry walls. Treatment of these facilities must follow regulations and processes per *Marine Corps Order P5090.2A* and *Sections 106* and 110 of the *National Historic Preservation Act of 1966, as Amended*.

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4.3 Environmental Conditions and Hazards

The following sections describe the existing environmental conditions and hazards at PCA.

4.3.1 Climate

The average annual precipitation at PCA is approximately 23 in.¹ Monthly average low and high temperatures range from 73 to 83 degrees Fahrenheit in the warmest month (August) and from 67 to 76 degrees Fahrenheit during the coolest month (January).²

4.3.2 Topography

The topography is generally flat, sloping slightly to the east toward East Loch, with elevations ranging from approximately 6 to 10 ft above mean sea level. PCA is almost completely built out, with most of the area covered in buildings or asphalt paving. There is little unpaved open space remaining. Facing East Loch to the east of the parcel is a strip of marshland.

4.3.3 Soils/Geology

The majority of soils at PCA are classified as mixed fill land, which consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources, resulting in various soil characteristics. Small areas of poorly to very poorly drained clays are found along the northern edge and in the southwest corner of PCA. These clays are characterized by slow to very slow permeability and slow to ponded runoff and present no more than a slight erosion hazard. In addition, the soils occupying the southwestern corner of the Annex have a high shrink–swell potential.³

4.3.4 Hydrology

4.3.4.1 Stormwater Runoff

PCA is located in flood hazard Zone D, which is outside of the 100-year flood plain. Due to its flat topography and lack of stormwater drainage infrastructure, PCA is prone to flooding during storm events.⁴

4.3.4.2 Wetlands

There are no wetlands within the boundary of PCA, but coastal areas outside the east boundary are designated as wetlands. The eastern boundary is near the

¹ Waipahu Station. Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

² Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.

³ Natural Resouces Conservation Service

Map Number 15003C0239G, Flood Insurance Rate Map, National Flood Insurance Program, Revised January 19, 2011.

East Loch of Pearl Harbor, which is classified by the State of Hawaii as a Class 2 estuary (inland water). The management objective of Class 2 waters is to protect the waters for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation.⁵

No amphibious training occurs in the offshore areas of PCA.

4.3.5 Wildlife Habitat

Due to the presence of near by wetlands, the Pearl Harbor National Wildlife Refuge, and Waiawa Stream, and the proximity to coastal areas, waterfowl and migrant birds have been spotted in the vicinity of PCA. Federal and State of Hawai'i endangered and threatened bird species that frequent the area are the ae'o, Hawaiian black-necked stilt (Himantopus mexicanus); 'alae 'ula, common moorhen (Gallinula chloropus sandvicensis); 'alae ke'oke'o, endemic Hawaiian coot, (Fulica alai); koloa, endemic Hawaiian duck (Anas wyvilliana); pueo, short-eared owl (Asio flammeus sandwichensis), and manu o kū, white tern (Gygis alba rothchildi).

According to the INRMP, there are no significant natural resources that need active management at PCA.

4.4 Utilities

Electrical, water, and wastewater systems for PCA are operated and maintained by NAVFAC Hawaii.

4.4.1 Electricity

PCA is fed from a 10/12.5 MVA (b) (3) (A), (b) (7)(F) (b) (3) (A), (b) (7)(F)

the top rating of the HECO substation. The 11.5 kV overhead primary distribution system can be extended either overhead or underground to feed areas planned for future development.

4.4.2 Water

PCA receives its potable water from the Navy's S1/S2 storage tanks at Foster Village. (b) (7)(F)

(b) (7)(F) The potable water distribution system at PCA includes water lines, valves, and fire hydrants and is operated and maintained by NAVFAC Hawaii. The Navy has an FY14 project to upgrade the Waiawa water transmission line from Pearl City to Ford Island.

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⁵ Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards, as amended November 15, 2014.

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4.4.3 Wastewater

The Pearl City Peninsula wastewater collection system, which includes PCA, is comprised of manholes, gravity sewer lines, pump stations, and force mains and is operated and maintained by NAVFAC Hawaii. All of the wastewater generated by Navy housing and operational facilities on the peninsula is conveyed to the City and County of Honolulu (CCH) wastewater system for treatment and disposal. Based on an agreement with CCH, the average daily wastewater flow discharge limit for the peninsula is 0.3 millions of gallons per day. The wastewater system is currently operating at full hydraulic capacity and cannot accommodate additional source flows without significant system infrastructure upgrades. Due to over development in the vicinity of the peninsula, the wastewater collection system has experienced overflows in the past.

4.4.4 Stormwater Management

The PCA stormwater drainage system includes drain inlets, drainage pipelines, and four drain outlets that discharge into Pearl Harbor. The area is prone to flooding during storm events due to a lack of adequate stormwater drainage infrastructure and flat topography.

4.5 Constraint Maps

Figure 4 provides a composite map of PCA's environmental conditions and hazards.

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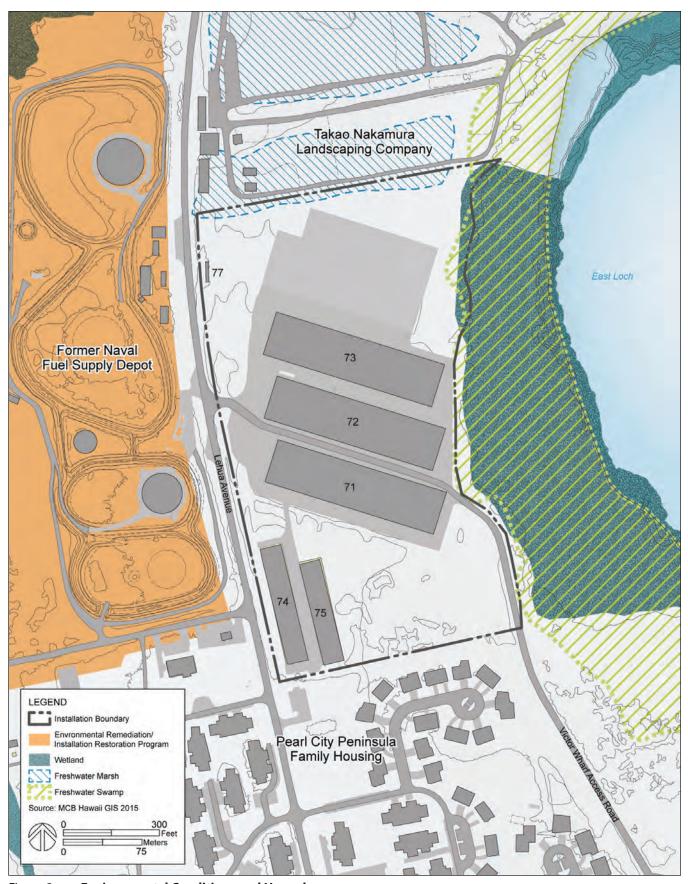


Figure 3 **Environmental Conditions and Hazards**

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5 Facility Site Development Plan

The Development Plan introduces a prioritized execution plan with rough order of magnitude (ROM) costs for PCA in the context of the installation's existing Capital Improvement Program. The Development Plan is detailed in Table 5-1, Summary of Proposed Development Actions and presented graphically on Figure 4, PCA Facility Site Development Plan. Table 5-1 describes each planning action, including any required demolition or other dependent actions.

The Facility Site Development Plan presents actions to meet the objectives outlined in Section 1.1. The time frame of each planning action is classified as short-term, mid-term, or long-term to reflect prioritization and phasing within the next 20 years. Funding availability, project competitiveness, reprioritization, and future mission requirements will ultimately drive the execution of the FSP. Short-term actions consist primarily of existing projects developed as part of the Installation's current five-year Program Objective Memorandum program. Mid-term actions are those targeted for development between 5 and 10 years, while long-term actions are those targeted for development between 10 and 20 years. The methodology and cost factors used to develop ROM costs for proposed projects are detailed in IMP Appendix D.

Long-term plans for MCB Hawaii Kaneohe Bay include development of warehouses to accommodate the requirements currently met at PCA. As these warehouses are constructed, the need for the PCA warehouses will diminish. PCA can meet future long-term storage requirements as needed. If the property is found to be surplus to the Marine Corps, it could be disposed through the U.S. General Services Administration's Office of Property Disposal.

Table 5-1 Summary of Proposed Development Actions

MAP ID	TIME FRAME	MCB HAWAII PROJECT#	PROJECT TITLE AND DESCRIPTION	ROM COST (\$K)
1	Long-term	Proposed	Deployment Lot Construct covered parking lots deployed units	(b) (5)
2	Long-term	Proposed	(b) (3) (A), (b) (7)(F)	

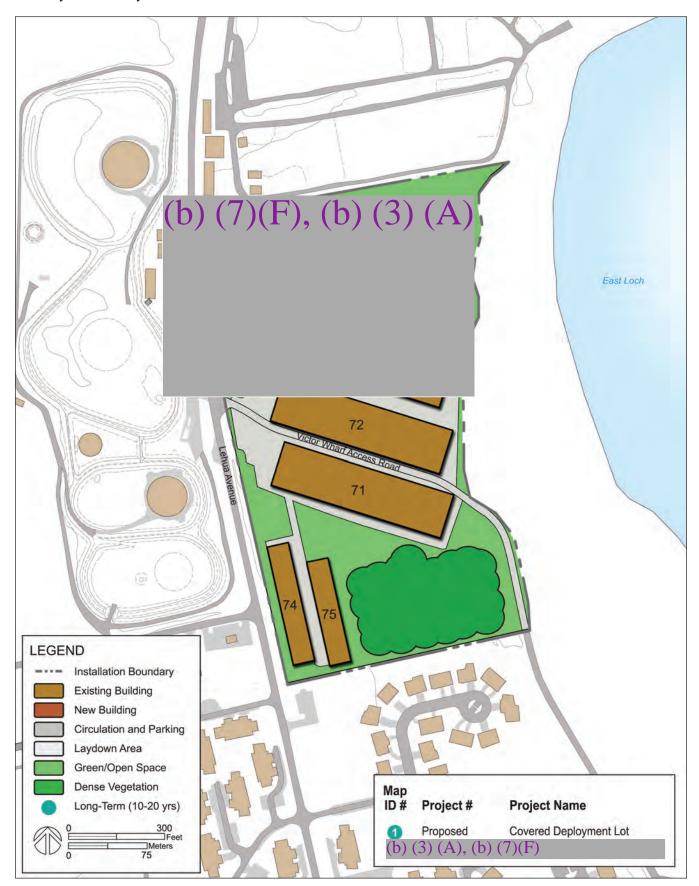


Figure 4 PCA Facility Site Development Plan



Photo by HHF Planners

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Acronyms and Abbreviations

ac Acre/Acres

CCN Category Code Number

CDP Census Designated Place

DoD Department of Defense

EA Each

FSP Facility Site Plan

ft Foot/Feet

ICRMP Integrated Cultural Resources Management Plan
INRMP Integrated Natural Resources Management Plan

MCB Marine Corps Base

ME Meter/Meters

NAVFAC Naval Facilities Engineering Command

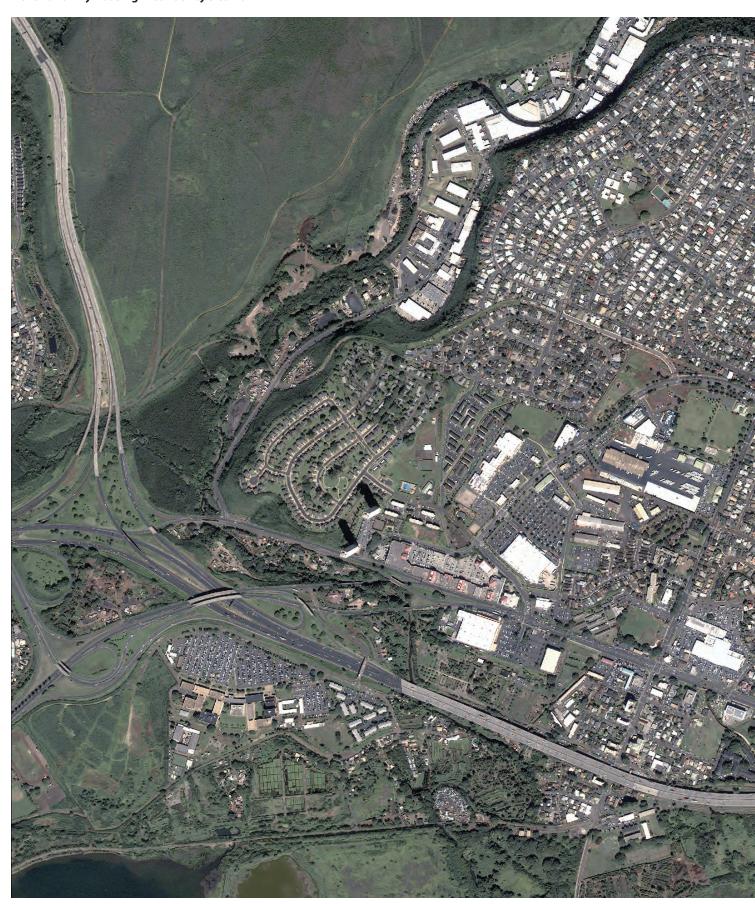
PCA Pearl City Annex

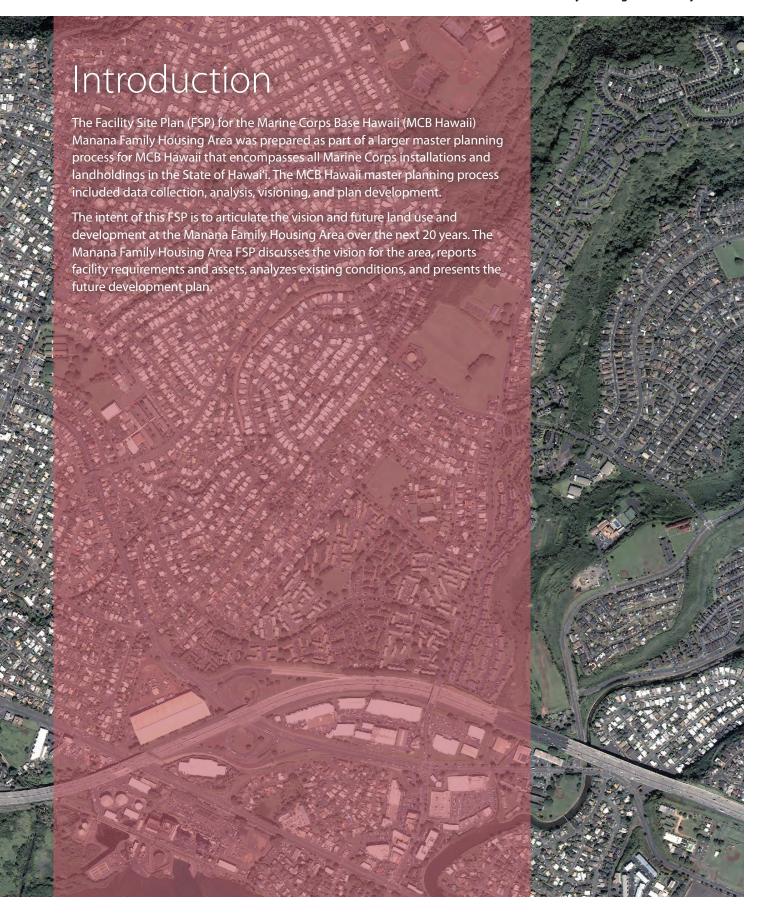
PPV Public-Private Venture

SF Square Feet

UFC Unified Facilities Criteria

UM Unit of Measure





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Introduction

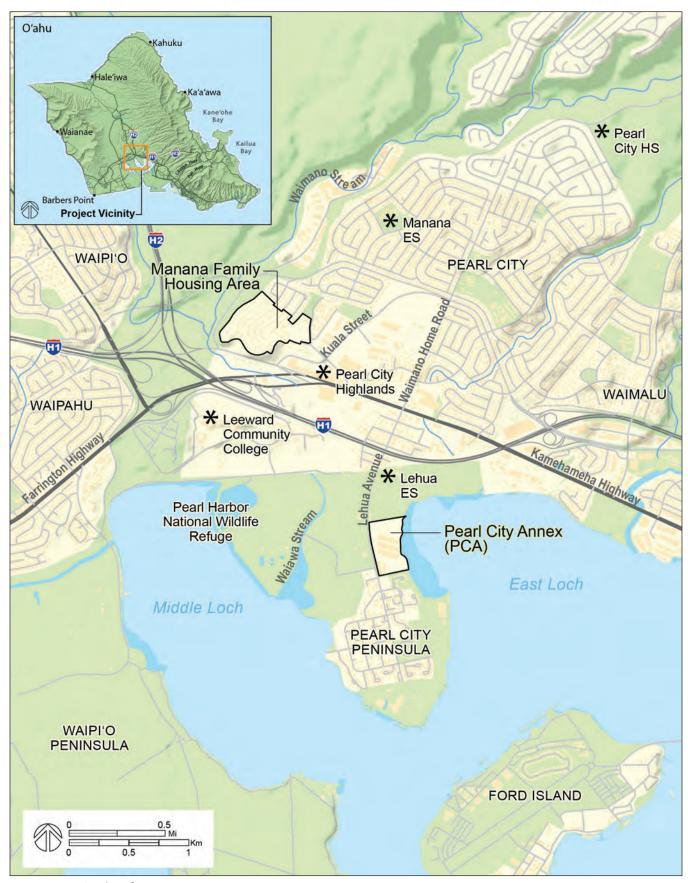


Figure 1 Regional Area Map

2 Introduction FOR OFFICIAL USE ONLY

1 Vision Plan

Manana Family Housing Area shares the Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.1 Mission, Vision, Goals, and Objectives

The Manana Family Housing Area has its own planning mission and vision that take into consideration the unique mission, functions, location, and physical conditions.

According to the *UFC 2-100-01, Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

Future development for Manana Family Housing Area is not anticipated, and, therefore, no planning goals and objectives were developed for this area.

1.2 Area Profile

1.2.1 Overview

The Manana Family Housing Area encompasses 62.2 ac in the town of Pearl City, as shown in Figure 1. The housing area is bordered by Kamehameha Highway to the south, Pearl Highlands Center and the Kuala Street commercial area to the east, residential housing to the north, and Waimano Valley and Waimano Stream to the west, as shown in Figure 2. The housing area is located approximately 20 miles from MCB Hawaii Kaneohe Bay.

The housing area is part of a larger military housing development that was constructed in 1959. Both the Marine Corps and Navy were assigned housing units with the Marine Corps housing area on the south portion of the development. The Marine Corps family housing area includes a total of 168 single-family and duplex housing units with recreation and community support facilities including an exchange and gas station, a youth center, an outdoor swimming pool and bath house, playing courts, playing fields, and picnic/playgrounds. Manana Family Housing Area is one of three MCB Hawaii installations that comprise the United States Marine Corps family housing inventory on O'ahu, which includes 2,414 units at MCB Hawaii Kaneohe Bay and 10 units at Camp Smith.

The Manana Family Housing Area has been leased to a private entity under the Public-Private Venture (PPV) program. The PPV program on MCB Hawaii properties includes extensive redevelopment of housing, infrastructure lines, roads and alleys, and other facilities to Ohana Military Communities.

Planning Mission

To provide safe and secure high-quality family housing and quality-of-life for Service members who mainly work on the leeward side of Oʻahu

Planning Vision

To provide a safe, walkable community with attractive, energy-efficient homes that maximize views and connect to a variety of community support facilities and gathering spaces through a greenspace and complete street network

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Section 1 | Vision Plan

1.2.2 History

The housing area's 62.17-ac tract of fee-simple land was acquired by condemnation in January 1942, and the land was reassigned from the Navy to the Marine Corps in two separate actions in 1959 and in 1963. According to the 2014–2019 Update to the Integrated Cultural Resources Management Plan (ICRMP), the Manana Family Housing Area was constructed under the provisions of the Capehart Housing Act of 1955 to improve the quality of life for military personnel.

1.2.3 Community Profile

The Manana Family Housing Area is located in the Pearl City census designated place (CDP) in Leeward, O'ahu. According to the 2010 Census, the CDP had a total population of 47,698. The town of 'Aiea borders Pearl City to the east, while Waipahu borders it to the west. Residential, commercial, industrial, and military uses are located in the vicinity, including Pearl Highlands Center and major retailers along Kuala Street east of Manana Family Housing Area and Pearl City Peninsula to the south. The CDP includes several public elementary and middle schools, Pearl City High School, and Leeward Community College.

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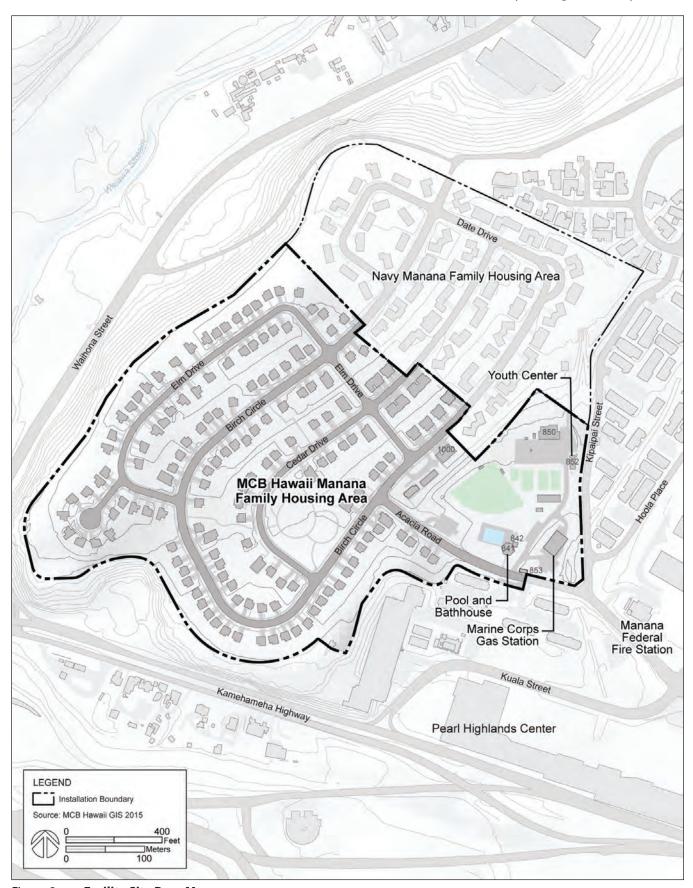


Figure 2 Facility Site Base Map

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Section 1 | Vision Plan



2 Facility Requirements and Land

2.1 Assets

Major assets at the Manana Family Housing Area include 168 single-family and duplex housing units, an exchange, a youth center, an outdoor swimming pool/bath house, playing courts, playing fields, and picnic/playgrounds.

2.2 Facility Requirements

Basic Facility Requirements for the Manana Family Housing Area were developed by a Naval Facilities Engineering Command (NAVFAC) Pacific asset evaluation in 2013. A summary of the major requirements are presented in Table 2-1 and reflect the existing surplus or deficit of assets for the facility.

Table 2-1 Facility Requirements and Assets

CCN	DESCRIPTION	UM	REQUIREMENT	ASSETS	SURPLUS/ (DEFICIENCY)
73020	(b) (7)(F)	1			
73025	(U) (I) (I)	,			
73066	Personnel Weather Shelters	SF	220	0	(220)
74002	Location Exchange	SF	5,493	5,493	0
74008	Exchange Food Store (Grocery)	SF	0	3,900	3,900
74030	Exchange Gas and Auto Station	SF	1,680	1,680	0
74055	Youth and School Age Children Center	SF	0	2,080	2,080
74089	Bathhouse	SF	1,555	1,375	(180)
75010	Outdoor Playing Courts	EA	4	4	0
75020	Playing Fields	EA	1	1	0
75030	Outdoor Swimming Pool	ME	25	25	0
75034	Wading Pool	EA	0	1	1

Marine Corps Base Hawaii Installation Master Plan Manana Family Housing Area Facility Site Plan

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3 Data Collection

Interviews with the MCB Hawaii Facilities Department and Housing Department were a primary source of information for the development of the Manana Family Housing Area Facility Site Plan. This FSP was also based on the following sources of information:.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The ICRMP documents the procedures and processes through which MCB Hawaii fulfills its commitment to compliance with applicable laws, regulations, and policies in the spirit of sound and responsible stewardship of cultural resources. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan (INRMP) Update, 2012–2016. November 2011.

The INRMP guides implementation of MCB Hawaii integrated natural resources management program on MCB Hawaii properties. INRMPs must support "no net loss" in capability of the installations' lands and waters to support military readiness while complying with a suite of federal laws governing natural resources management and stewardship and public access to the same, subject to safety, environmental and military security constraints.

U.S. Marine Corps Forces, Pacific. Marine Corps Base Hawaii Optimization Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The study supports an ongoing Department of Defense process to evaluate the realignment of forces in the Pacific Region. Development of the study involved an evaluation of existing conditions at MCB Hawaii, including land at Pearl City Annex (PCA) and Manana Family Housing Area; identification of underutilized lands; verification of proposed near-term projects essential to continuation of operations at MCB Hawaii; and analysis of the feasibility of additional units at the base and their potential impact on quality of life at MCB Hawaii. The study is intended to provide Marine Corps leadership with a sense of the "art of the possible" as it relates to the future buildup of forces in Hawai'i.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final. December 2006.

The framework of the Master Plan is a land use scheme that meets future requirements while efficiently utilizing existing assets. Plan recommendations are intended to consolidate and improve unit integrity and operations, provide sufficient land for training areas and support facilities, and ensure that environmental quality is not degraded and, where possible, is enhanced.

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Section 3 | Data Collection



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4 Site Analysis

This section describes the existing land use; archaeological, cultural, and historic resources; and environmental conditions and constraints at the Manana Family Housing Area.

4.1 Land Use

The main portion of the housing area is fully developed with 168 family housing units, and a smaller portion of the property to the east is used for Marine Corps Community Services facilities required to support the housing area residents.

4.2 Archaeological, Cultural, and Historic Resources

According to the 2014 MCB Hawaii ICRMP, new facility construction, including increased vehicular traffic and human presence as result of construction activity, and ground disturbance, including grubbing, grading, excavation, and installation of fence lines and utility lines, could affect cultural resources at Manana Family Housing Area. As of June 2014, one cultural resource study and one inventory/data recovery archaeological investigation of the Manana Family Housing Area had been completed. The probability of occurrence of archaeological resources within the housing area is low: past uses including sugar cultivation, World War II era construction, and 1950s residential development "have disturbed the former surface and even subsurface soils and sediments to the extent that any cultural materials that may have been present at one time have almost certainly been either destroyed completely or disturbed to the point where they lack meaningful contexts."

4.3 Environmental Conditions and Hazards

The following sections describe the existing environmental conditions of the Manana Family Housing Area.

4.3.1 Climate

Mean annual rainfall in the area is approximately 23 in. Monthly average low and high temperatures range from 73 to 83 degrees Fahrenheit in the warmest month (August) and from 67 to 76 degrees Fahrenheit during the coolest month (January). ²

4.3.2 Topography

The Manana Family Housing Area is located on the seaward end of a gently sloping ridge overlooking the coastal flatlands that border the inland edge of

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¹ Waipahu Station. Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

² Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i..

Pearl Harbor. The large, relatively level developed portion of the housing area gently slopes to the south and southeast at a 3 to 7 percent gradient and ranges in elevation from 80 to 140 ft above mean sea level. The west and south sides of the parcel are defined by steep escarpments that drop to the floodplain of Waiawa Stream.

4.3.3 Soils/Geology

The majority of the housing area consists of moderately permeable silty clay, which is subject to slow to medium runoff and a slightly moderate erosion hazard. In the eastern and southern-most edges, silty clays of moderately rapid permeability are subject to medium to very rapid runoff and present a severe to very severe erosion hazard.

4.3.4 Hydrology

The Manana Family Housing Area is located within the Federal Emergency Management Agency flood hazard Zone X—areas which lie outside the 0.2 percent annual chance flood (also known as the 500-year flood).³ The adjacent Waiawa Stream has associated flood zones; however, the housing area is located at a higher elevation, separated from the floodplain by steep slopes on the western boundary.

4.3.5 Wildlife Habitat

According to the INRMP, the Manana Family Housing Area contains no significant natural resources. There are no wetlands within the boundaries of the housing area. There are no known federal- or state-listed threatened or endangered species within the area. The only indigenous species to frequent the area is the migrant *kōlea* or Pacific golden plover.

4.3.6 Hazardous Waste

No Installation Restoration Program sites have been identified at the Manana Family Housing Area.

4.4 Utilities

The Manana Family Housing Area has basic utilities including potable water and electricity, which are provided by the Navy's Pearl Harbor water system via NAVFAC Hawaii and the Hawaiian Electric Company, respectively. The wastewater system is owned, operated, and maintained by NAVFAC Hawaii. The gravity lines connect to the City and County of Honolulu's system, which conveys wastewater to the Hono'uli'uli treatment plant. Solid waste is collected by private contractor and disposed at the Waimānalo Gulch Landfill or the H-POWER facility.

³ Map Number 15003C0239G, Flood Insurance Rate Map, National Flood Insurance Program, Revised January 19, 2011.

⁴ Draft Environmental Assessment Hawaii PPV Housing Phase II Marine Corps Base Hawaii, February 2006.

5 Facility Site Development Plan

No development has been identified for the Marine Corps land at Manana Family Housing Area.

In 2006, the Marine Corps housing units were demolished and replaced with new housing units as part of the PPV development. Except for one Capehart duplex, all of the units on the Navy lands are planned to be demolished. The Marine Corps and Navy are currently in discussions about transferring Navy land to the Marine Corps. If additional family housing needs are identified in the future, the Navy area could be redeveloped.

Marine Corps Base Hawaii Installation Master Plan Manana Family Housing Area Facility Site Plan

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Acronyms and Abbreviations

ac Acre/Acres

CCH City and County of Honolulu

CCN Category Code Number
CDP Census Designated Place

DoD Department of Defense

FSP Facilities Site Plan

ft Foot/Feet

ICRMP Integrated Cultural Resources Management Plan
INRMP Integrated Natural Resources Management Plan

MCB Marine Corps Base

MEC Munitions and Explosives of Concern

mi Mile/Miles

MMRP Military Munitions Range Program
NRHP National Register of Historic Places

UFC Unified Facilities Criteria
UXO Unexploded Ordnance

WVIA Waikane Valley Impact Area



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Marine Corps Base Hawaii Installation Master Plan **Waikane Valley Impact Area Facility Site Plan**

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1 Vision Plan

WVIA shares the Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.1 Mission, Vision, Goals, and Objectives

WVIA has its own planning mission and vision that take into consideration the unique mission, functions, location, and physical conditions of the area.

According to *UFC 2-100-01*, *Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

The planning goals of WVIA include the following.

- Minimize exposure and prevent migration of unexploded ordnance.
- Restore the area to agricultural use or forest reserve.
- · Provide access to significant cultural sites.

The specific planning objectives of WVIA include the following.

- Conduct surface clearance to accessible areas and significant cultural sites
- Install fence to prevent access to areas that have not been cleared.

Planning Mission

To protect the surrounding public from unexploded ordnances

Planning Vision

In support of current and future missions, our planning vision is to create a land reserve that supports community, cultural, and natural resources

3

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Section 1 | Vision Plan

1.2 Area Profile

1.2.1 Overview

The 187-ac WVIA is located in the center of Waikāne Valley at the northern end of Kāne'ohe Bay, approximately 15 mi north of MCB Hawaii Kaneohe Bay, as shown in Figure 1. WVIA was previously part of the former Waikane Valley Training Area, a live-fire training range and maneuver area that once encompassed 1,061 ac. Access to WVIA is from Waikāne Valley Road. Construction of permanent structures was prohibited, and, as such, the area contains no modern structures.

According to the 2014–2019 Update to the Integrated Cultural Resources Management Plan (ICRMP), WVIA was acquired in 1989 through condemnation after it was declared unsafe for use due to unexploded ordnance on the site. Now closed, WVIA is part of the Military Munitions Range Program (MMRP), which addresses munitions-related concerns including explosive safety, environmental, and health hazards from releases of unexploded ordnance (UXO), discarded military munitions, and munitions constituents found at nonoperational range locations. It was designated a Munitions Response Site and has been the subject of the MMRP since 2005. Remediation efforts, discussed in Section 4.3.4, are currently taking place.

1.2.2 History

In the early 1940s, the U.S. Army leased over 2,000 ac in Waiāhole and Waikāne Valleys from a private owner. Known as the Waikane Training Area, the area was used for jungle training; small arms, artillery, mortar firing; and live-fire training from 1942 to 1976. After the Army discontinued use of the area, the Marine Corps leased some of the same property. According to the ICRMP, the 1953 WVIA lease specified certain conditions of use, provided for ordnance clean up and replanting of impact areas after termination of the lease, and agreed to hold harmless the landowners against any claims arising from ordnance detonation after termination of the lease. In 1961, another lease was executed. The new lease, which largely duplicated the terms of the 1953 lease, included the Kamaka family as lessors.

In 1976, private landowners terminated the lease with the Marine Corps; military training in the area ceased, and the land was returned to the original owners. While the lease was terminated, it was determined that the land could never be certified clear of UXO, which was stipulated in the lease agreement. In 1989, approximately 187 ac was acquired by the federal government via condemnation because of safety concerns from the ordnance that remained on the site after these clearance efforts. In 1992, a four-strand wire fence was constructed along the south perimeter with warning signs to prevent access to the area. In 2004, this fence was replaced with a 7,200 ft-long chain link fence, and warning signs were posted on the south perimeter and partially along the east and west sides of the area to prevent unauthorized entry.

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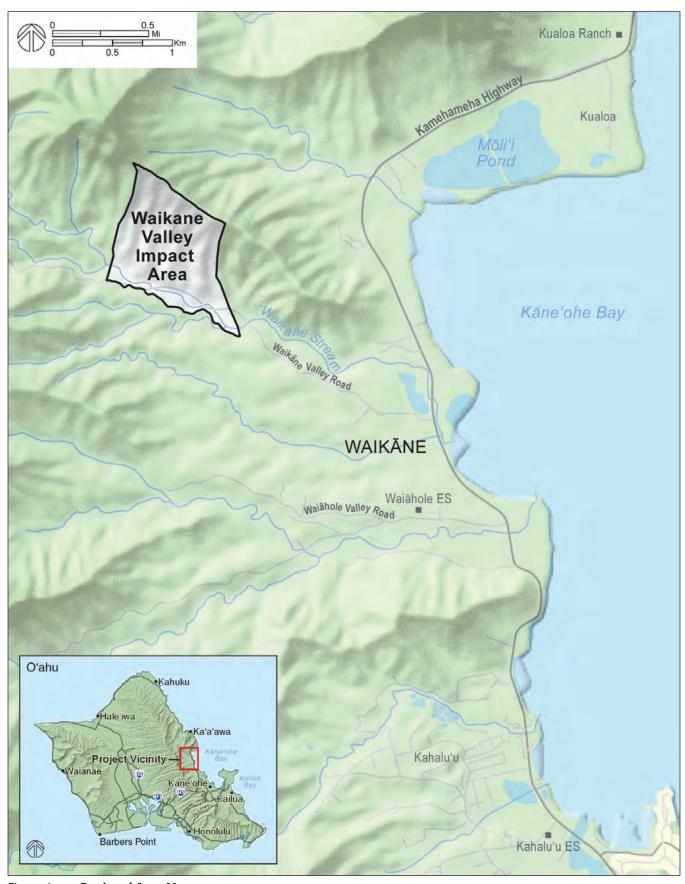


Figure 1 Regional Area Map

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1.2.3 Community Profile

The WVIA is located in the Waikane Census Designated Place (CDP) on the Windward side of Oʻahu. According to the 2010 Census, the CDP has a population of 778. The community lies along the shoreline of Kāneʻohe Bay. Major industry in the area includes agriculture and tourism; Kualoa Ranch, a major tourist attraction and film location, is adjacent to the north of the CDP. Residents in the area are involved in fishing and hunting activities.

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2 Facility Requirements and Land

2.1 Assets

The area is secured in part by a fence along the southern boundary and along portions of the east and west boundaries. This asset is recorded in the Naval Facilities Engineering Command Pacific inventory; categorized as a security/perimeter fence (CCN 87210) and measured 9,793 ft long.

2.2 Facility Requirements

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Marine Corps Base Hawaii Installation Master Plan Waikane Valley Impact Area Facility Site Plan

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3 Data Collection

Interviews with MCB Hawaii Facilities Department were a primary source of information for the development of the WVIA Facility Site Plan. This FSP was also based on the following source of information.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The ICRMP documents the procedures and processes through which MCB Hawaii fulfills its commitment to compliance with applicable laws, regulations, and policies in the spirit of sound and responsible stewardship of cultural resources. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan Update (MCB Hawaii INRMP), 2012–2016. November 2011.

The INRMP guides implementation of MCB Hawaii integrated natural resources management program on MCB Hawaii properties. INRMPs must support "no net loss" in capability of the installations' lands and waters to support military readiness while complying with a suite of federal laws governing natural resources management and stewardship, and public access to the same, subject to safety, and environmental and military security constraints.

U.S. Marine Corps Forces, Pacific. United States Marine Corps O'ahu Land Use Study. Prepared by Helber Hastert & Fee, Planners. December 2013.

The study investigated the potential for Department of Defense (DoD) lands on the island of Oʻahu to accommodate the Defense Policy Review Initiative proposal to relocate seven units of the III Marine Expeditionary Force from Okinawa, Japan, to Oʻahu between 2026 and 2031.

Department of the Navy, Naval Facilities Engineering Command Hawaii, Facilities Planning and Real Estate Department. Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan, Final, December 2006.

The framework of the Master Plan is a land use scheme that meets future requirements while efficiently utilizing existing assets. Plan recommendations are intended to consolidate and improve unit integrity and operations, provide sufficient land for training areas and support facilities, and ensure that environmental quality is not degraded and, where possible, is enhanced.

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Section 3 | Data Collection

Marine Corps Base Hawaii Installation Master Plan Waikane Valley Impact Area Facility Site Plan

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4 Site Analysis

This section describes the existing land use; archaeological, cultural, and historic resources; and environmental conditions and constraints at WVIA.

4.1 Land Use

There are no modern structures on the installation, which is bounded to the north, south, and west by undeveloped forest and agricultural lands. The City and County of Honolulu (CCH) controls land to the southeast that is designated as the Waikāne Nature Preserve. To the east are a mix of residential areas, beach parks, and private property along Kamehameha Highway.

4.2 Archaeological, Cultural, and Historic Resources

According to the ICRMP, the primary habitation of Waikāne Valley was likely along the coastal plain fronting Kāne'ohe Bay. Traditional use of the WVIA focused on cultivation along Waikāne Stream. During the 19th and early 20th centuries, the lands were primarily used for wetland agriculture (rice and taro) and residential use. In 1916, the Waiāhole Ditch and Tunnel System was completed to convey water to sugar plantation on the leeward side of O'ahu.

4.2.1 Archaeological Resources

Six archaeological sites and site complexes have been identified within the WVIA, as shown in Figure 2. One site has been listed on the National Register of Historic Places (NRHP), and two are eligible for listing. Site 1078, called Waikāne taro flats, is associated with traditional irrigated taro cultivation and was listed on the NRHP in 1973. The site encompasses a large area at the southwest corner of the WVIA, straddling both sides of Waikāne Stream. Site 2889 is the Kamaka family shrine that is dedicated to the god Lono. Although the antiquity of this shrine is not known, access to this site and Site 6551, Waikane Spring, is important to the Waikāne community as a continuing site for Hawaiian ceremonial practice, based on information from family members and local residents. Site 2890 is an agricultural complex located downstream of the Waikāne taro flats and just upstream of the confluence of Waikāne and Waike'eke'e Streams.

4.3 Environmental Conditions and Hazards

4.3.1 Topography

There are two major land forms of the WVIA—the valley floor and lower gentle slopes adjacent to Waikāne Stream and the northern steep slopes to the top of the valley ridge crest. The WVIA terrain rises from about 100 ft above mean sea level at the southern boundary to approximately 1,400 ft along the northern boundary.

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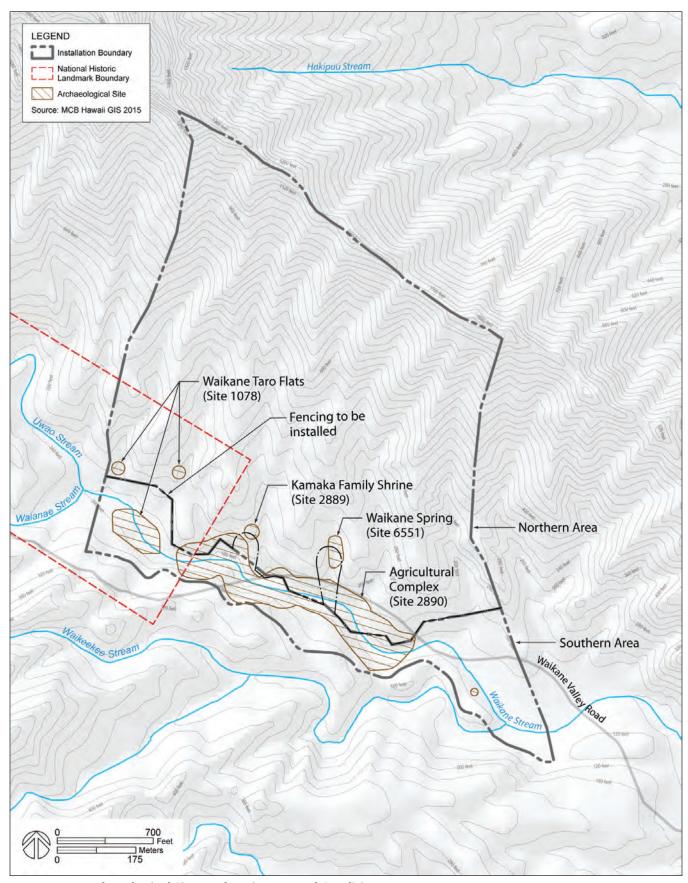


Figure 2 Archaeological Sites and Environmental Conditions

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4.3.2 Hydrology

Waikāne Stream flows through the lower portion of WVIA. There are no wetland areas within the property.

4.3.3 Wildlife Habitat

According to the INRMP, the vegetation is dominated by nonnative plant species. Native plant species present include five that are endemic to Hawai'i: 'ōhi'a lehua; koa; hāpu'u 'i'i (Cibotium chamissoi); naupaka kuahiwi (Scaevola gaudichaudiana); and 'ākia (Wikstroemia oahuensis). No threatened or endangered plants have been identified.

The endemic short-eared owl or *pueo* (Asio flammeus sandwicensis) has been observed, and it is possible the endangered endemic 'elepaio (Chasiempis sandwichensis ibidis) use resources within the valley. A total of 21 invertebrates have been detected in the area, 9 nonnative and 12 native, none of which are listed as threatened or endangered.

4.3.4 Ordnance Remediation

According to the INRMP, WVIA is being investigated for clean up options under the DoD MMRP. WVIA is an ordnance-contaminated property where active natural resources management is not safe or possible. However, baseline environmental studies are being conducted, and basic natural resources stewardship activities include periodic walk-through surveys of the stream valley and visual surveys of erosion trends. These surveys are intended to detect any emergency deterioration of resource conditions that could affect the larger valley or downstream resources and recommend corrective action. Regular surveillance of illegal entry and hunters continues to be performed in this area by the MCB Hawaii Conservation Law Enforcement Officer in cooperation with Federal and State agents.

The Southern Area along Waikāne Stream contains no evidence of munitions and explosives of concern (MECs). The Northern Area, specifically along the lower steep slopes of the WVIA, contains the highest concentration of MECs and has high potential for additional explosives.

4.4 Utilities

There are no utilities at WVIA.

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5 Facility Site Development Plan

As a result of munitions remaining on site from historical military activities, a remedy was selected to address potential MEC and munitions constituent hazards. This selected remedy is in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

The Decision Document Waikane Valley Impact Area, Kaneohe, Oahu, Hawaii (February 2013) describes the selected remedy as follows.

- Surface clearance of accessible areas in the Southern Area and the Northern Area
- Subsurface clearance to a depth of 2 ft of a 10-ft-wide buffer strip along the boundary separating the Southern and Northern Areas
- Removal of the existing fencing from the Southern Area and installation of new fencing along the northern edge of the cleared buffer strip between the Southern and Northern Areas
- Subsurface clearance to a depth of 2 ft in the Southern Area in a 50-ft-wide corridors to and around the Kamaka Family Shrine and Waikāne Spring and the installation of fencing along and around these cleared areas to allow free access to the sites from the Southern Area
- Additional land use controls, including notification letters to local landowners and an educational program to inform the community of risks and mitigation measures

The expected outcome of the selected remedy is to minimize exposure to MEC, prevent migration of MEC to accessible areas, restore the Southern Area to agricultural use and the Northern Area to forests reserve use, and provide access to significant cultural sites.

Marine Corps Base Hawaii Installation Master Plan Waikane Valley Impact Area Facility Site Plan

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Source: Google Earth

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Acronyms and Abbreviations

ac Acre/Acres

ATC Air Traffic Control

EIS Environmental Impact Statement

FARP Forward Arming and Refueling Point

FSP Facilities Site Plan

ft Foot/Feet

in Inch/Inches

ICRMP Integrated Cultural Resources Management Plan
INRMP Integrated Natural Resources Management Plan

MCB Marine Corps Base

mi Mile/Miles

MTA Molokai Training Area

MTSF Molokai Training Support Facility

sq yd Square Yard

UFC Unified Facilities Criteria

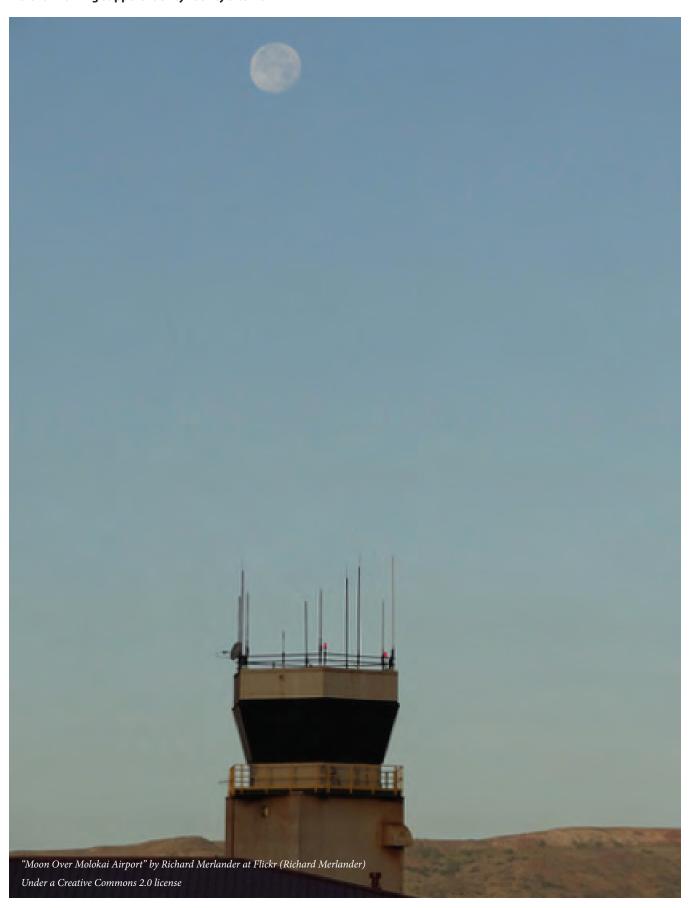
Introduction

The Facility Site Plan (FSP) for the Marine Corps Base Hawaii (MCB Hawaii) Molokai Training Support Facility (MTSF) was prepared as part of a larger master planning process for MCB Hawaii that encompasses all Marine Corps installations and landholdings in the State of Hawai'i. The MCB Hawaii master planning process included data collection, analysis, visioning, and plan development.

The intent of this FSP is to articulate the vision and future land use and development within MTSF over the next 20 years. The MTSF FSP discusses the vision for the area reports facility requirements and assets, analyzes existing conditions, and presents the future development plan.



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1 Vision Plan

MTSF shares the MCB Hawaii Installation's overall vision as stated in the 2015 Marine Corps Base Hawaii Vision Plan as follows.

Marine Corps Base Hawaii is committed to meeting mission readiness goals and operational requirements by providing modern, efficient, and sustainable facilities. To achieve this, we will consolidate facilities and collocate command elements, and we will retain and optimize training capabilities while creating safe campuses and neighborhoods connected by greenspace networks.

1.1 Mission, Vision, Goals, and Objectives

MTSF has its own planning mission and vision that take into consideration the unique mission, functions, location, and physical conditions.

According to the *UFC 2-100-01, Installation Master Planning* (May 2012), planning goals flow directly from the vision and focus on long-term redevelopment and construction projects needed to fulfill mission requirements and reshape the installation. Objectives define how the goals in the vision can be achieved and are specific and measurable.

The planning goal of MTSF is to create a secure training support area. The specific objective is to secure the property boundary to allow development of a Forward Arming and Refueling Point (FARP).

1.2 Area Profile

1.2.1 Overview

MTSF encompasses 12 ac and is located across Maunaloa Highway (State Highway 460) from Molokai Airport, as shown in Figure 1. No range capabilities exist at MTSF itself, but the facility was closely tied to the former Molokai Training Area (MTA), which was used during the 1980s and early 1990s to support units arriving on the island for training. Now inactive, the MTSF is vacant. There are no structures or buildings, and the property is overgrown with vegetation.

1.2.2 History

In 1941, Governor's Executive Order 936 transferred 14.108 ac to the federal government for use as the Molokai Airport Naval Reservation. According to the 2014-2019 Updated to the Integrated Cultural Resources Management Plan (ICRMP), facilities constructed to support military activities included a helicopter landing pad and parking apron, areas for tent bivouacking, temporary billeting, warehousing, a tool shed and garage, and fueling systems. With the coming of war, control of the airport was taken over by the armed services, which retained authority over the installation until 1947 when management was returned to the Territory of Hawai'i. However, the MTSF parcel remained under military authority and use in support of military training on the island. After training activities on Moloka'i were discontinued, the need for a support facility ended. MTSF structures were demolished in 1999.

Planning Mission

To provide secure, expeditionary forward-based arming and refueling for assault support day or night

Planning Vision

To provide an environmentally safe refueling and support area to accommodate military flights between MCB Hawaii and other areas within Hawai'i

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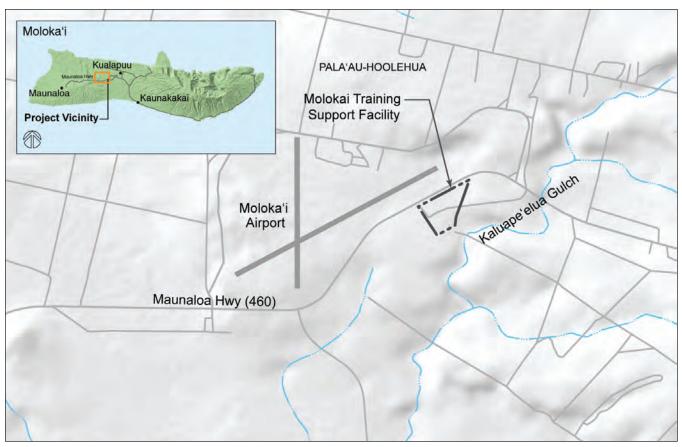


Figure 1 Regional Area Map

1.2.3 Community Profile

MTSF is located on the island of Moloka'i. The island's largest town is Kaunakakai, which, according to the 2010 Census, has a population of 3,425. As of 2014, the largest industry on the island is seed production. Although tourism is not as thriving an industry on Moloka'i as it is on many of the other islands in Hawai'i, Moloka'i has, on average, approximately 1,000 visitors a day. The island has a single hospital—Molokai General Hospital—four public schools, including Moloka'i High School, and the Molokai Education Center, which is a part of the University of Hawai'i Maui College.

4 Section 1 | Vision Plan FOR OFFICIAL USE ONLY

2 Facility Requirements and Land

2.1 Assets

No vertical structures exist at MTSF. The land is primarily covered with vegetation and remnants of concrete foundations or landing pads.

Airspace above MTSF, which falls under Molokai Airport, is Class D during daytime and Class G at other times. Class D airspace is controlled airspace within 2,500 ft above the airport elevation. Air traffic control (ATC) services are provided within Class D airspace. Class G is uncontrolled airspace, where ATC has no responsibility or authority. Molokai Airport airspace extends out in a 4.3-mi radius from the airport.

2.2 Facility Requirements

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U.S. Department of Transportation, Federal Aviation Administration. Pilot's Handbook of Aeronautical Knowledge, 2008.

Marine Corps Base Hawaii Installation Master Plan Molokai Training Support Facility Facility Site Plan

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3 Data Collection

Interviews with MCBH Facilities Department and Operations and Training Department were a primary source of information for the development of MTSF. The Facility Site Plan was also based on the following source of information.

Department of the Navy, Naval Facilities Engineering Command, Pacific. Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2014–2019. June 2014.

The ICRMP documents the procedures and processes through which MCBH fulfills its commitment to compliance with applicable laws, regulations, and policies in the spirit of sound and responsible stewardship of cultural resources. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics.

Marine Corps Base Hawaii. Integrated Natural Resources Management Plan (INRMP) Update, 2012–2016. November 2011.

The INRMP guides implementation of MCBH integrated natural resources management program on MCBH properties. INRMPs must support "no net loss" in capability of the installations' lands and waters to support military readiness while complying with a suite of federal laws governing natural resources management and stewardship, and public access to the same, subject to safety, environmental and military security constraints.

Department of the Navy. Environmental Impact Statement (EIS) for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i. Volumes I and II. June 2012.

The EIS was prepared to assess potential environmental impacts associated with the proposed basing of the MV-22 Osprey tiltrotor aircraft and H-1 Cobra and Huey attack and utility helicopters in Hawai'i. Operational requirements associated with this proposed action were identified in order to conduct a systematic analysis to identify suitable basing locations. The EIS evaluated MTSF as a training support area.

Department of the Navy; U.S. Marine Corps Forces, Pacific; and Marine Corps Base Hawaii. United States Marine Corps Hawaiian Islands Range and Training Requirements, Capabilities Analysis, and Alternatives Feasibility Study. March 2014.

The purpose of the study is to provide a series of recommendations for the Marine Corps to prioritize and pursue that will aid in the sustaining of future Marine Air Ground Task Force training in the Hawaiian Islands.

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Marine Corps Base Hawaii Installation Master Plan Molokai Training Support Facility Facility Site Plan

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4 Site Analysis

This section describes the existing land use; archaeological, cultural, and historic resources; and environmental conditions and constraints of MTSF.

4.1 Land Use

MTSF is adjacent to the south side of the Molokai Airport in central Moloka'i. Scattered, low-density single-family homes and agricultural lots are present around the airport, along with some industrial properties. The Maunaloa Highway (Highway 460) borders the site to the north.

4.2 Archaeological, Cultural, and Historic Resources

According to the ICRMP, there is little potential for archaeological resources at MTSF. No archaeological and cultural resources have been identified. However, if significant development were to occur at MTSF, further analysis and appropriate consultation are required to determine whether resources are present.

4.3 Environmental Conditions and Hazards

The MTSF lies on the central saddle area of Moloka'i between Maunaloa on the west and the east Moloka'i mountains on the east.

4.3.1 Climate

The average annual precipitation at MTSF is approximately 23 in.² Monthly average low and high air temperatures at MTSF range from 72 to 82 degrees Fahrenheit in the warmest month (August) and from 65 to 75 degrees Fahrenheit during the coolest month (February).³

4.3.2 Topography

MTSF is situated on relatively level terrain at an elevation ranging from approximately 130 to 140 ft above mean sea level. There is a mild grade that slopes to the south.

4.3.3 Soils/Geology

Surface conditions at MTSF currently consist of loose gravel and soil. Soils are classified as Moloka'i silty clay loam MuA (0 to 3 percent slopes) and MuB (3 to 7 percent slopes).

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² Molokai Airport Station, record period 1939-2004. Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

³ Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management. State of Hawai'i.

4.3.4 **Hydrology**

Surface water and stormwater either infiltrates into the ground or sheet flows toward the gulch, which flows south toward Pala'au Homesteads and into the mud flats. No perennial streams exist within the MTSF. Runoff is slow to medium, and erosion hazard is slight to moderate.

MTSF is located in the Federal Emergency Management Agency Zone X outside the 0.2 percent annual chance flood plain (500-year flood).4

4.3.5 **Wildlife Habitat**

There are no wetlands located within or in close proximity to MTSF. There are no natural habitats or features at MTSF and no federal- or state-listed species are known to occur at MTSF.

4.3.6 Noise

Existing noise associated with Marine Corps helicopters at Molokai Airport is focused around the runway. Existing aircraft noise is limited and does not extend beyond the airport.

4.3.7 Hazardous Materials

According to the Final EIS for Basing MV22 and H1 Aircraft in Support of III MEF Elements in Hawai'i, MTSF has two Installation Restoration Program sites: "Dangerous" Sign Area and Paint Pit. These sites are located in the south portion of the property. The "Dangerous" Sign Area site was closed in 2000; the Paint Pit site is in the process of being closed. All underground and above ground storage tanks have been removed.

4.4 Utilities

There are no utilities at MTSF.

Map Number 1500030160F, Flood Insurance Rate Map, National Flood Insurance Program, Revised November 19, 2015

5 Facility Site Development Plan

According to the Final EIS for Basing MV22 and H1 Aircraft in Support of III MEF Elements in Hawai'i, MTSF is being reactivated to serve as a transit and refueling point between O'ahu and other training areas in Hawai'i.

Military Construction Project P-890 would improve the area for a FARP, which would provide a secure area for equipment and personnel to support refueling activities. Proposed improvements include clearing, grubbing, and paving approximately 2,000 sq yd and installing a perimeter fence.

Marine Corps Base Hawaii Installation Master Plan Molokai Training Support Facility Facility Site Plan

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Cover photos: HHF Planners. MARINE CORPS BASE HAWAII, 141215-M-TH981-003.JPG/Kristen Wong, Dec 19, 2014. 131107-M-NG901-003.JPG/Cpl. Nathan Knapke, Nov 15, 2013. 140205-M-NG901-002.JPG/Cpl. Nathan Knapke, Feb 7, 2014



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